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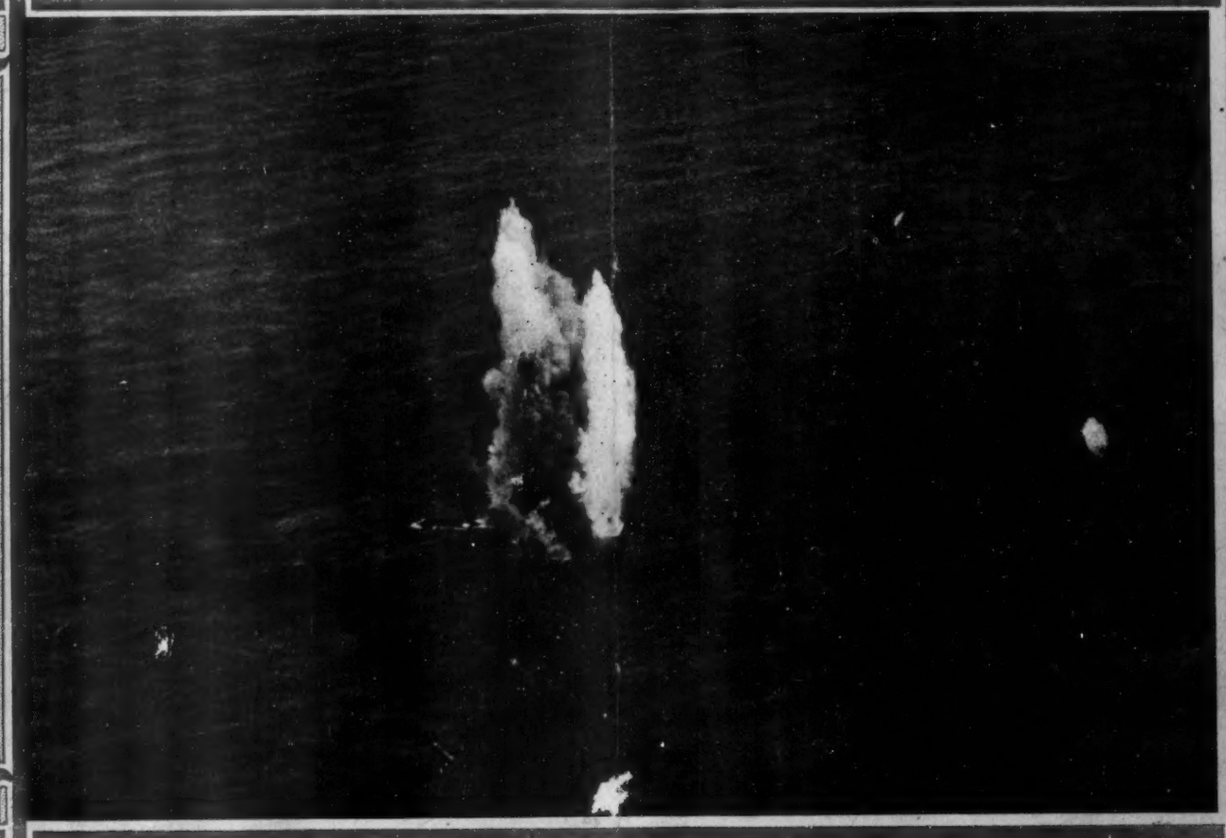
AVIATION AND AIRCRAFT JOURNAL



Naval Aircraft Scoring a Direct Hit on the Submarine U-117

Official Photo, U. S. Navy

VOLUME XI
Number 1

SPECIAL FEATURES

SCHEDULE OF THE BOMBING TESTS
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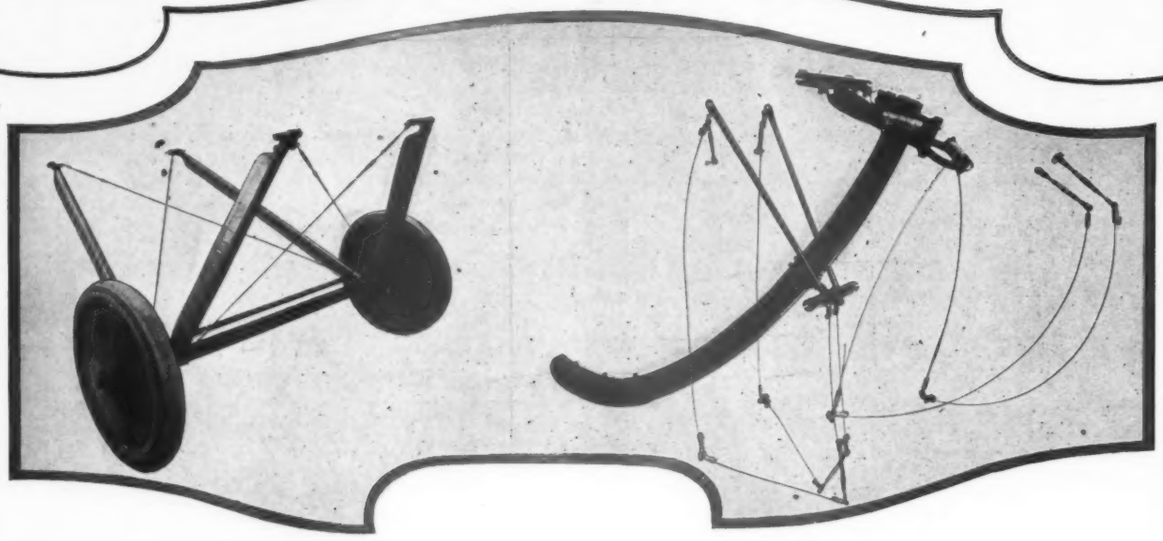

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AVIATION AND AIRCRAFT JOURNAL

JULY 4, 1921 VOL. XI. NO. 1

Member of the Audit Bureau of Circulations

INDEX TO CONTENTS

Editorials	7	Packard Engine Test	21
Schedule of the Bombing Tests	8	The White Aerial Fleet	21
Army Obtains Navy Dornier All-Metal Plane	12	Paris-Warsaw Air Service	21
The Cost of Aircraft Insurance	12	Sadi Lecointe Signs Up for Pulitzer Race	21
Soaring and Gliding Experiments in Germany	13	New Types of Parachutes	22
Aircraft Owners of Pennsylvania	14	New Dayton-Wright Wing	22
Deutsch de la Meurthe Aviation Cup	14	Development of National Resources	22
A Distinctive Design: The Airliner	15	Air Mail Reorganization	23
DH-4 Succors Disabled Submarine Chaser	15	Reduction in Air Service Personnel	23
"Who's Who in American Aeronautics"	18	New Air Line	23
Active Aero Clubs	20	Congratulations	23
A Product of the West	20	Airdrome Notes	24
Two-Man Altitude Flight	21		

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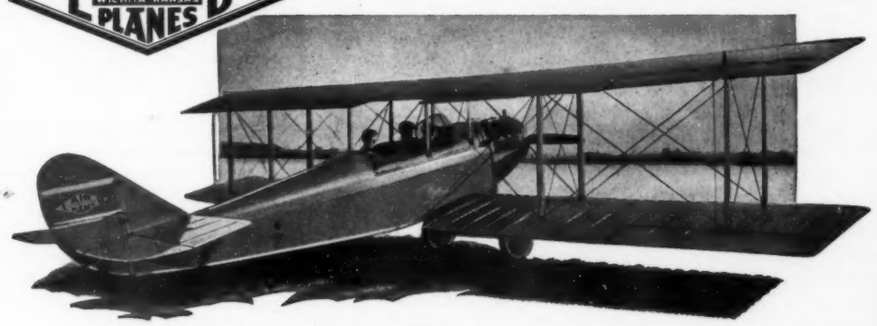

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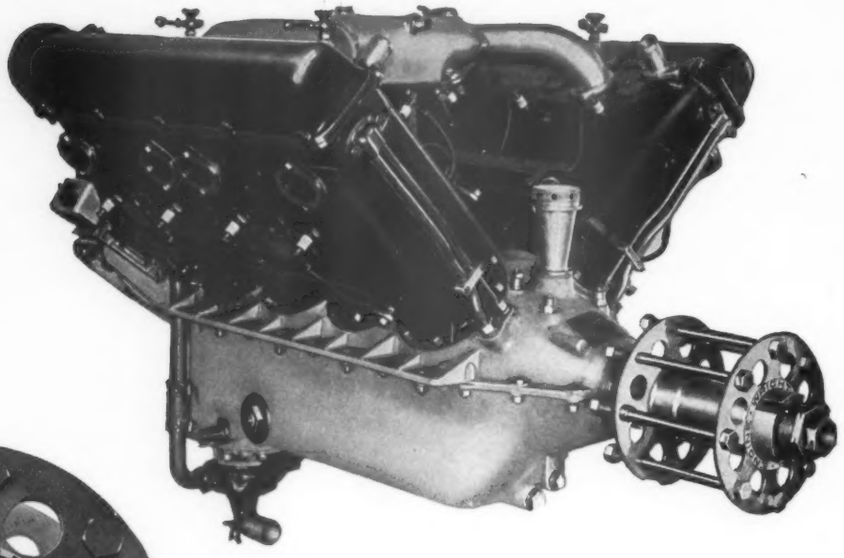

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FROM now on all WRIGHT engines will have this nameplate on the hub. This is a visible guarantee to all who fly with the engine that it was made by us in our own plant. This plate certifies that every ounce of material was critically examined, then machined by our own experienced men to exact gauge and carefully assembled. The nameplate guarantees the engine has passed our exacting running test requirements. While we are building aircraft engines this vigilance will never be relaxed.

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2. *High power*	Speed, climb, power reserve.
3. *Low fuel consumption*	Economy, long travel radius, increased useful load.
4. *Short overall length*	Increased manoeuvreability, compact installation.
5. *Interchangeable parts*	No long repair periods, economy, safety.
6. *Longevity*	Many WRIGHT engines built four years ago are still flying. Many have flown 1,000 hours and over. With th E-2 and H-2 engines incorporating changes based on actual experience from hundreds of our own engines, we advise commercial flyers to figure on ultimate life of 2,000 hours.
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	WRIGHT E-2	WRIGHT H-2
Power at 2000 R. P. M.	220 H. P.	358 H. P.
" " 1800 "	200 H. P.	326 H. P.
Weight, dry with hub	485 lbs.	620 lbs.
Gas per H. P. hour	.48 lbs.	.5 lbs.
Overall length, including hub and mag.	4'-1⅛"	4'-3 23/32"

NOTE:—The power given is the mean rated power, many individual engines give higher power and lower consumption.

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AVIATION AND AIRCRAFT JOURNAL

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ALEXANDER KLEMIN, TECHNICAL EDITOR
EDWARD P. WARNER, CONTRIBUTING H. T. A. EDITOR
RALPH H. UPSON, CONTRIBUTING L. T. A. EDITOR

Vol. XI JULY 4, 1921 No. 1

Editorial Announcement

ALEXANDER KLEMIN who has been technical editor of AVIATION AND AIRCRAFT JOURNAL for five years with the exception of the time he was in the Air Service retires with this issue. His connection with a company which is to build aircraft will preclude his continuing to give editorial attention to the publication.

The work of Mr. Klemin in aeronautics in this country has placed him in the front rank of aeronautical engineers. He resigned as Instructor in Aeronautics at the Massachusetts Institute of Technology to enter the Army Air Service and his experimental engineering at McCook Field has been praised highly by Army Engineers. His consulting practice which he will continue has added to his reputation, and it is hoped that, while he will have no active connection with the publication, he can in a consulting capacity continue to give valued advice and contributions.

Giant Military Machines

A RECENT paper published by *The Aeronautical Journal* on the Development of Giant Aircraft in Germany, is the best possible example of what may be done in a study of this character. The paper is evidently written by a man thoroughly well posted on the entire development. He has dealt with the subject in a logical, systematic manner; and has drawn practical conclusions which are so sound and valuable that they can be taken to heart by every designer interested in large military machines.

One definite conclusion drawn is that the military bomber machine should be made as large as possible so that the greatest possible range and the greatest possible weight of bombs may be carried with a minimum of personnel. Theoretical limitations to size do not appear to hold, and the thing to do is to build larger and larger machines, if the bomber is to achieve a maximum usefulness.

Three main lines of development are considered. Type A embodies merely an increase in size of the ordinary airplane with engines carried on the wings; in Type B the wing truss and the rest of the design follows conventional lines, but provision is made for a central power plant, driving, by means of gears, either one propeller in the nose of the machine or multiple propellers placed at intervals along the leading edges of the wings. Type C is of the internally braced type.

There is very little to chose between Type A and Type B as regards efficiency and amount of useful load carried. Whereas Type A involves greater head resistance, Type B enables a greater efficiency to be given to the propeller, but it does not distribute the weight, so that in the last resort no advantage is achieved by it either in performance or load carried. On the other hand Type C, the internally braced type, seems to be the only path toward increased efficiency and greater load carrying.

Considering the multiplicity of engines, the writer comes again to the conclusion that the only reason why the Germans used this means was because they had no large engines available. The ony sound principle in design would be to reduce the number of engines to a minimum and to use the most powerful engines available.

Considering geared drives of a variety of types, the definite conclusion seems to be that, owing to their complexity and technical difficulties, their use is not advisable at the moment.

The Naviclature of Naviation

WE have before commented on the peculiar nomenclature the Navy is using in connection with aeronautics. Contrary to tradition and general custom, for the Navy "aviation" means aeronautics, an aeronaut is an aviator, and seaplanes become "airboats". The latest contribution to this novel nomenclature consists in designating "airboats and dirigibles" under the generic term of "scouting planes"—as our readers may read in the schedule for the bombing tests prepared by the Navy.

Naval men are prone to chuckle if a landlubber calls a cruiser a battleship or if he mistakes the bow for the stern, for it merely displays his ignorance of naval matters. The question then occurs whether the Navy uses aeronautical misnomers for lack of familiarity with men and things that fly, or whether it actually attempts to improve our existing nomenclature. Should the latter be the case, it may not be amiss to call the attention of the Navy to the consistent efforts that have been made in the past with a view to unifying aeronautical terminology. These efforts have resulted in the National Advisory Committee for Aeronautics issuing an aeronautical nomenclature which, barring a few exceptions, agrees with that prepared by the Technical Terms Committee of the Royal Aeronautical Society of Great Britain and approved by the British Engineering Standards Association and the British Advisory Committee for Aeronautics. This nomenclature, which is the result of labors extending over several years, is generally admitted—by men who fly and build aircraft—to be excellent. Aeronautical publications have generally adopted it and efforts are being constantly made to educate the lay press to its use, so the public may come to know correct terms in aeronautics. This is by no means unimportant, for a proper understanding of matters aeronautical presupposes a knowledge of aeronautical terms—which is naturally made more difficult if several terms are used for designating the same thing.

It would therefor seem desirable that the Navy follow the attitude of other government departments in using the nomenclature of the N.A.C.A. instead of coining new words or assigning new meanings to old words, which cannot but cause confusion.

Schedule of the Bombing Tests

The bombing tests conducted by the Navy with the cooperation of the Army will continue until July 20 when the climax will be reached with the destruction of the ex-German Battleship Ostfriesland.

The schedule of exercises call for the following tests:

28 June—Exercises with ex-Iowa;

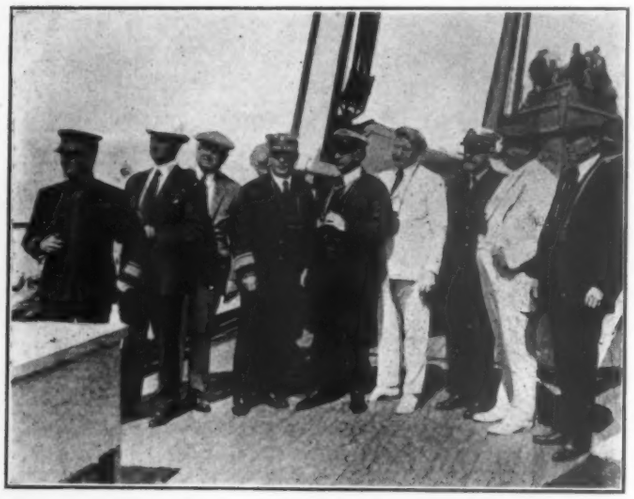
13 July—Destruction of ex-German destroyer G-102 by aircraft;

15 July—Destruction of ex-German destroyers S-132, V-43 by gunfire (Destroyer Division 36).

18 July—Destruction of ex-German Cruiser Frankfurt by aircraft and gunfire;

20 July—Destruction of ex-German Battleship Ostfriesland by aircraft and gunfire.

If more than one day is required for the completion of any



WATCHING THE BOMBING TESTS OF THE U-117 (LEFT TO RIGHT): REAR ADM. W. FULLAM, REPR. J. MCCLINTIC OF OKLA., REPR. W. W. LUFKIN OF MASS., ADM. W. L. ROGERS, REPR. F. C. HICKS OF N. Y., REPR. A. E. STEPHENS OF OHIO, REAR-ADM. N. A. MCCULLEY, REPR. B. L. ROSENBLOOM AND I. N. MCPHERSON OF MAINE

Photo International

of the exercises, they will be resumed on the day following that set forth in the above schedule.

Vice Admiral H. P. Jones, U. S. Navy, Commander Battleship Force, is in charge of operations scheduled for the month of June.

Captain A. W. Johnson, U. S. Navy, Commander of the Air Force, Atlantic Fleet, is charged with the operations of all Air Forces engaged.

Captain S. R. Doyle, U. S. Navy, Commander of the Naval Air Station, Hampton Roads, Va., is placed in charge of the aircraft base at Hampton Roads for the purpose of these exercises, and of communications between Hampton Roads Base and the bases at Yorktown, Langley Field, and such other bases as may be established.

Lieutenant Commander Jules James, U. S. Navy, is detailed as Chief Censor.

The Train Commander is charged with:

Bringing the ex-German ships to the firing point and having them anchored in position prior to the time set for beginning each exercise, about 50 miles east of Cape Charles Light Vessel in not less than 50 fathoms of water. Organizing a salvage party on the Quail. Detailing the Lebanon for the Atlantic Fleet Camera Party for gunfire exercises and necessary tugs or sweepers for rake parties as required.

Brigadier General William Mitchell, U. S. Army, has been designated by the War Department as the Commander of the Army Provisional Air Brigade and is in immediate command of all Army Air Forces engaged in these exercises.

Senatorial and Congressional parties and Naval Officers from without the Fleet will be embarked on the Henderson.

The Patrol Vessels

For the experiments with the ex-German ships, destroyers will be stationed every ten miles between Thimble Shoal Light and the ship which is being bombed.

In the Iowa test at the zero hour there will be two lines of patrol vessels (destroyers) in position. The destroyers in each line will be about twenty-two miles apart. The northern end of the inner line will begin fifteen miles east of Cape Henlopen, pass close to Fenwick Island Shoal Light Ship, thence to Winter Quarter Shoal Light Ship, thence to a position ten miles off the entrance to Chesapeake Bay. The inner line will extend from here to a position eighteen miles east of Cape Hatteras. The outer line will be thirty miles to the eastward of the inner line. There will be destroyers at both the northern and southern extremities of the inner line and at approximately every twenty-two miles within.

The patrol vessels will be divided into three detachments—a Cape Hatteras Detachment, a Cape Charles Detachment and a Cape Henlopen Detachment.

Scouting planes (airboats and dirigibles) have orders from Commander Air Force to be at their stations on the scouting line at one and one-half hours after the zero hour to scout to a distance of one hundred miles off shore. If the ex-Iowa is not detected by the scouts on their search to seaward, they will return on a parallel ten miles to the southward. When the ex-Iowa is detected, airboats have orders to assemble by divisions and proceed to the attack.

At one and one-half hours after the zero hour all destroyers on the two patrol lines will begin steaming to the eastward, speed twenty knots, and continue for two hours or until the airboat scouts locate and report the ex-Iowa.

If the ex-Iowa has not been reported by three and one-half hours after the zero hour, destroyers will stop for one-half hour and then retrace their course to the westward for two hours, speed twenty knots.

When the location of the ex-Iowa is reported by airboat scout, the patrol destroyers of each detachment will proceed as if she had not been reported until Destroyer Detachment Commanders are informed by Commanders of Airboat Detachments in same area that their divisions are assembled and proceeding to attack.

Whenever a plane is reported down, or in need of assistance, the nearest destroyer will go to the rescue, informing adjoining vessels of the force.

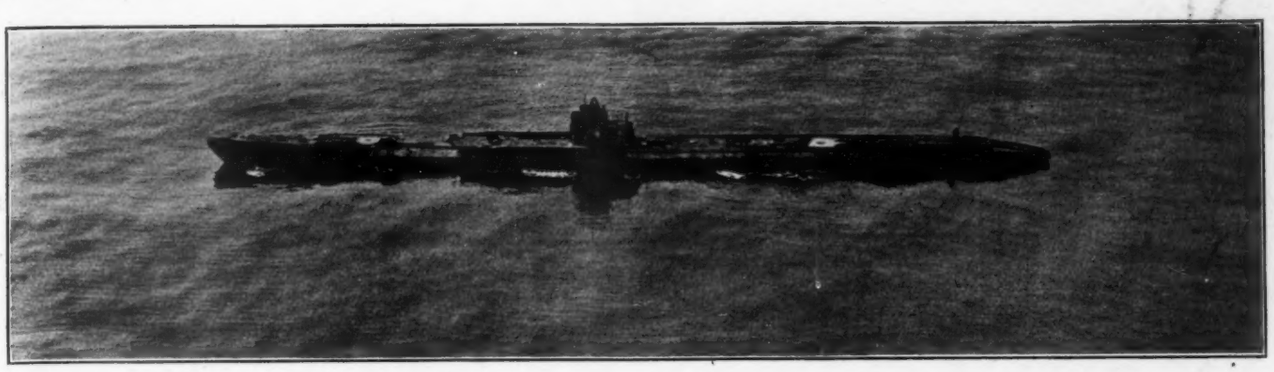
Rake and Camera Observations

A rake party will be organized by the Commander Air Force, with Lieutenant Commander V. C. Griffin, Jr., U. S. Navy, in charge, which will make all rake observations of both the fall of bombs on all bombing exercises and of the fall of shot for gunfiring exercises.

For the rake observations of the fall of bombs, both for the ex-German ships and for the ex-Iowa, two tugs or mine sweepers will be provided by the Commander Train. The tugs will take position at safe distance from falling bombs and bomb explosions, and will be under the immediate direction of Lieutenant Commander Griffin as to the positions which they will maintain relative to the target. Standard bombing rakes will be used and will be furnished by the Commander Air Force.

Triangulation Camera Observations of the fall of shot on the gunfire exercises will be made by the Atlantic Fleet Camera Party on board the Lebanon. The Lebanon will take a position at a distance from the targets which will insure against any fragments of high explosive shell coming on board. Motion and still pictures of the fall of shot will also be taken when practicable.

Photographers from the Atlantic Fleet Camera Party will be detailed to report to the Board of Observers for taking pictures on the ex-Frankfurt and ex-Ostfriesland when the observers go on board for examination of damage done by bombs or projectiles.



EX-GERMAN SUBMARINE U-117, WHICH WAS SUNK BY NAVAL BOMBING AIRCRAFT ON JUNE 21 OFF THE VIRGINIA CAPES. TWO DIRECT HITS SANK THE VESSEL

Official Photo, U S. Navy

Board of Observers

The following Board of Observers has been appointed:

Captain Luke McNamee, U. S. Navy, (Nevada), Senior Member;
Commander Harvey Delano, U. S. Navy, (Arizona);
Commander G. McC. Courts, U. S. Navy, (Oklahoma);
Commander W. G. Child, U. S. Navy, (Shawmut);
Lieutenant Commander W. D. Kilduff, U. S. Navy, (Nevada);
One Representative of the Bureau of Ordnance; Captain J. R. Y. Blakely, U. S. Navy;
One Representative of the Bureau of Construction & Repair;
One Representative of the Bureau of Engineering;
Lieutenant Commander A. G. Zimmerman, U. S. Navy, (Nevada).

The Board of Observers is charged with obtaining the maximum information regarding the effect of bombs and gunfire from the exercises outlined in these instructions.

If it should develop during or after the bombing tests that more profitable information might be obtained from exploding bombs on turret tops, or on conning towers, or in any other similar location, it is desired that this be done by static explosion.

Reporting the Results

In the case of the destruction of the ex-German ships, the Board of Observers shall:

Observe and report the number and type of bombs dropped, the height from which each bomb is dropped, and its point of fall;

Observe and report the action of bombs, projectiles, and depth charges that are expended;

Observe and report the actual effect and damage to the ships, bearing in mind the age of the ships, their state of preservation, and their date of design, under three general headings:

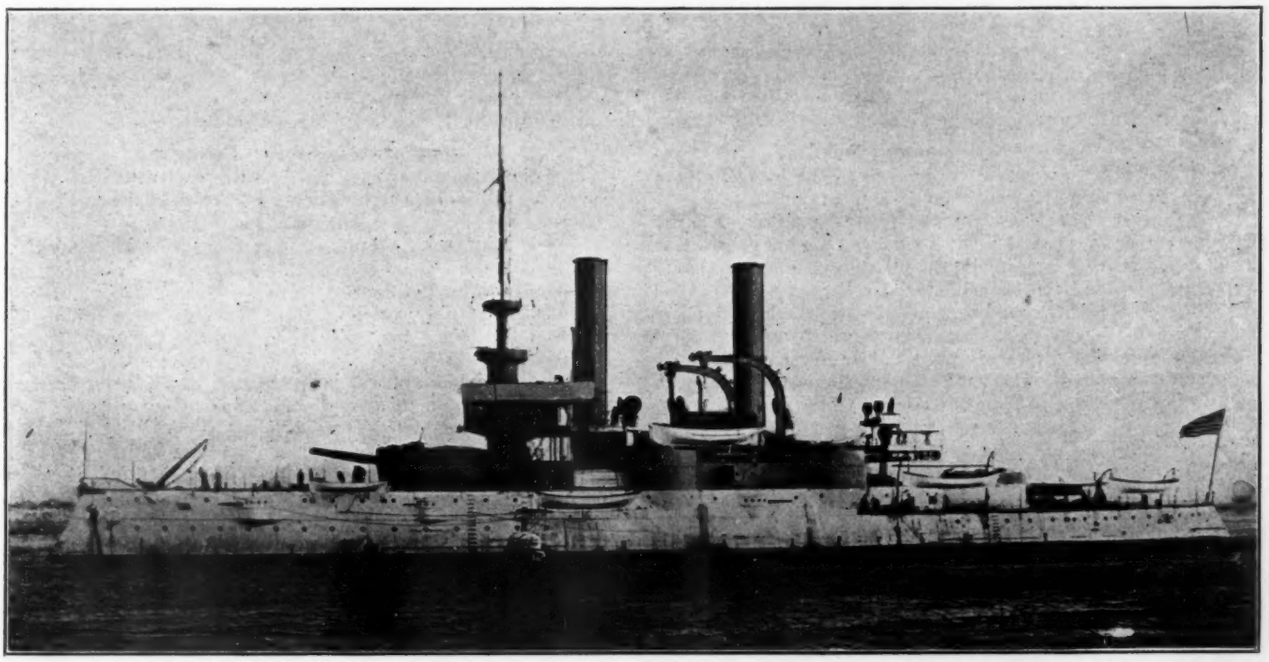
(1) Probable damage to personnel,

(2) Damage to A.A. guns and defenses, and to light equipment and structure exposed on the topsides.

(3) Damage to the main fighting equipment (particularly lighting and control system), and to the main structure of the ship.

Make such deductions as can reasonably be made, based on the consideration of facts coming under (c), (1), (2) and (3), as to the probable effect and damage to ships of new design, and good state of preservation in the several classes of men-of-war and auxiliaries.

Make such recommendations as may be suitable, after con-



THE RADIO-CONTROLLED EX-BATTLESHIP IOWA, WHICH WAS TO BE THE TARGET IN THE DUMMY BOMBING TEST JUNE 28 A THICK HAZE CAUSED THE POSTPONEMENT OF THIS TEST

Official Photo, U S. Navy

sideration of (a), (b), (c), and (d), for the improvement of the various classes of ships of the Navy in equipment, material, design, and construction.

The Iowa Test

In the case of the exercises with the ex-Iowa, the Board of Observers will plot from rake observations as accurately as possible the position of all bombs dropped.

In addition to any other subject of interest, the Board will submit data on the following items:

Standard time of zero hour; Standard time at which position of target was determined by air force; Standard time at which bombing squardon was sighted; Number and type of bombs carried by each plane; Number of planes making the attack; Time at which first bomb was dropped; Time at which last bomb was dropped; Total number of bombs dropped; Altitude at which bombs were dropped; Sketch of bombing formations; Plot of fall of all bombs; Chronological report by Commanding Officers, Bombing Squadrons; Probabilities of destruction of aircraft by surface vessels under conditions simulated by this attack; Probabilities of lessening liability of hits by bombs by maneuvering ship; Ability of aircraft to carry out successful search and deliver attack at considerable distance off shore.

Safety Precautions and Rules

No plane will fly over any vessel except the target, or over any village or building, while bombs are attached.

The Rules of the Road for the air, as prescribed herein, will be carefully observed by all pilots, together with such local rules as may be established by the commanders of the different bases and the Commander Air Force.

Whenever a flight, squadron, or division commences an attack, the other divisions in the vicinity will be careful not to interfere with the attacking planes, keeping clear until the attack is completed. Upon the completion of a prescribed attack, the attacking unit will proceed at once to its base.

After passing over the target, planes will habitually turn to the right until completion of their attacks, when they will proceed to base.

Any plane running short of fuel will return to base without further orders.

International rules of the air shall apply to all movements of aircraft.

Three or more planes flying in company will be considered a formation; less than three planes in company will be considered single planes.

Any formation of planes will have the right of way over single planes which will keep clear.

Planes or formations meeting head-on, or nearly so, shall each turn to the right.

When planes or formations cross, the plane or formation having the other on its right shall keep clear.

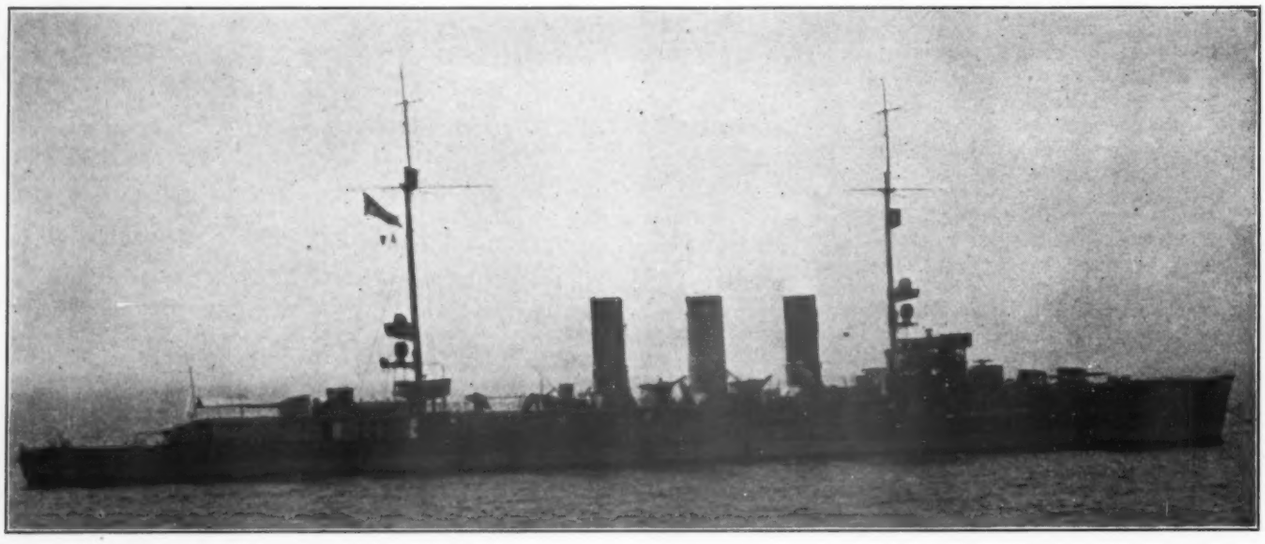
Formations overtaking other planes shall not pass below single planes nor above or below another formation in the same vertical plane.

Formations of planes meeting at different altitudes shall pass above or below each other in the same vertical plane only when there is sufficient difference in altitude for maneuvering in case of motor failure.

Overtaking planes shall keep well clear of those overtaken.

Planes will leave their bases in time to arrive over the target in accordance with the pre-arranged schedule. This schedule will be subject to change by the Commander Air Force at the firing point, in order to avoid unnecessary delay or the unnecessary flying of planes. In the absence of any such orders from the Commander Air Force, the pre-arranged schedule will be carried out for each exercise.

In case of any plane having a forced landing, it will broadcast the fact and the nearest plane of her division will stand by and circle over it, or fly between it and the nearest surface craft, until rescued. In case of a land plane having a forced landing at sea, the nearest airboat will proceed to its assistance and will rescue the crew, if practicable. The primary object will be to save the lives of the personnel.



EX-GERMAN SCOUT CRUISER FRANKFURT, TO BE BOMBED BY AIRCRAFT ON JULY 18
Official Photo, U S. Navy

Destruction of German Destroyer

The ex-German destroyer G-102 will be attacked by 250-lb. Army bombs on 13 July. Flights by Army planes will be as follows:

1—3 Martin Bombers	18 bombs
2—3 Martin Bombers	18 "
3—3 Martin Bombers	18 "
4—3 Martin Bombers	18 "
5—6 DH-4's	12 "
6—5 DH-4's	10 "

Group Commanders will be permitted to fly their planes in any formation and to drop their bombs in any manner from any safe altitude.

These groups will depart from the base so that the first flight will arrive over the target at 9:00 A. M.

The Commander Air Force at the target will notify the base commander two hours before the attack begins whether the weather is suitable for firing on that date.

The Commander Air Force will notify the base commander when each flight has completed its attack and whether the destroyer is still afloat. If the destroyer is sunk, all planes will return to base and discontinue exercises for the day.

After the completion of the bombing by the Army, should the destroyer still be afloat, she will be attacked by the same groups of Navy planes as for use against the submarine, using 250-lb. Mark I bombs.

The ex-German destroyers will be anchored in approximate column formation, approximately 400 yd. apart.

Attack on the Ex-Frankfurt

The ex-Frankfurt will be attacked Monday, July 18, with Navy 250-lb. heavy-case and 520-lb. light case bombs and Army 300-lb. and 600-lb. bombs.

The first series of attacks will be made with 250-lb. and 300-lb. bombs. After each attack scoring a hit, an examination of the ship will be made by the Board of Observers.

The second series of attacks will be made similarly with 520-lb. light-case and 600-lb. bombs. An examination of the vessel will be made after each attack scoring a hit.

The Senior Officer Present, upon recommendation of the Board of Observers, will decide when a sufficient number of hits have been made with any type of bomb.

The planes to be used in the attacks with 250-lb. and 300-lb. bombs are listed below:

Attack	Planes	Class of bomb	No.
1	1st & 2nd Divisions of F-5-L's	250-lb.	12
2	2 Army Martin Bombers	300-lb.	12
3	3rd Division of F-5-L's	250-lb.	6
4	1 Army Martin Bomber	300-lb.	6
5	4th Division of F-5-L's	250-lb.	12
6	2 Army Martin Bombers	300-lb.	12

The planes for the first attack will arrive at the target at 9:00 A. M.; other flights on signal.

The planes to be used in the attacks with 520-lb. and 600-lb. bombs are listed below:

Attack	Planes	Class of bomb.	No.
1	5 Navy Martins	520-lb.	15
2	4 Army Martin	600-lb.	16
3	4 NC's, each with two	520-lb.	8
4	2 Army Martin	600-lb.	9

The first 520-lb. attack should be ready to take off at 9:00 A. M., in case the 250-lb. attack has been successful. The planes will be signalled when to leave, but should be ready to leave at half-hour intervals.

Destruction of Ex-Ostfriesland

A—250-lb. heavy-case and 300-lb. bombs. Make at least 3 hits.

B—550-lb. heavy-case and 600-lb. bombs. Make at least 2 hits.

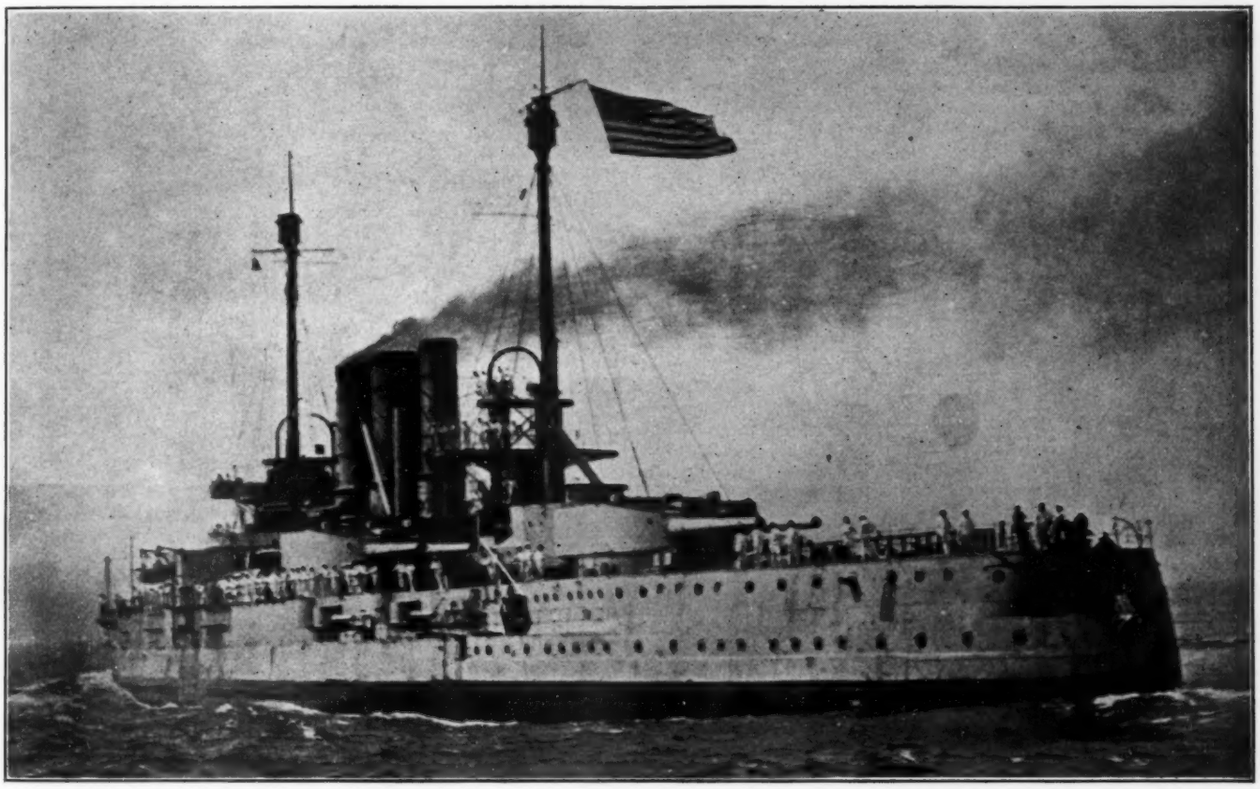
C—100-lb. bombs or heavier—

D—2000-lb. bombs—

(Two hits with either of heavier types).

Bombing with any type of bomb may be discontinued by Senior Officer Present at any time after the above number of hits have been obtained.

The time for attacking divisions to arrive at target will be signalled from target.



EX-GERMAN BATTLESHIP OSTFRIESLAND, TO BE BOMBED BY AIRCRAFT ON JULY 20

Official Photo, U S. Navy

A—250-lb. and 300-lb. bombs——Drop 2 bombs each attack

1—Marines in 6 DH's	250-lb.	12	bombs
2—2 Army Martin Bombers	300-lb.	12	"
3—Division of F-5-L's	250-lb.	12	"
4—2 Army Martin Bombers	300-lb.	12	"
5—Division of F-5-L's	250-lb.	12	"
6—2 Army Martin Bombers	300-lb.	12	"

B—550-lb. and 600-lb. bombs——Drop 2 bombs each attack

1—4 NC's	550-lb.	8	"
2—3 Army Martin Bombers	600-lb.	6	"
3—1 Division of F-5-L's	550-lb.	6	"
4—3 Army Martin Bombers	600-lb.	6	"
5—1 Division of F-5-L's	550-lb.	6	"
6—3 Army Martin Bombers	600-lb.	6	"

C—1000-lb. bombs——Drop 1 bomb on each attack

1—3 Martin planes (Navy)	8	bombs
2—4 Army Martin Bombers	8	"

If 100-lb. bombs have scored a hit on first day, proceed with 200-lb. bombs. If not, continue with 1000-lb. bombs, using

1—4 NC's, each carrying two 1000-lb. bombs	8	bombs
2—4 Army Martin Bombers, with 1000-lb. bombs	8	bombs

D—2000-lb. bombs.

1—3 Martins (Navy)	3	bombs
2—Army Martin Bombers		

An examination will be made after completion of attacks

with 250-lb. bombs, after completion of attacks with 520-lb. bombs, and after each hit with a heavier bomb.

If none of the 1000-lb., or heavier, bombs explode on the 75-lb. deck at the top of the casemate armor amidships, one or more of this type of bomb will be exploded statically on that deck in order that the extent of the damage to a deck of this thickness may be determined, particularly the damage downward through the deck.

If the ex-Ostfriesland remains afloat upon the conclusion of the aircraft attacks, the Pennsylvania will attack her with gun-fire using the main battery. The range will be not less than 18,000 yards. Full or half salvos may be used in order to obtain the necessary number of hits with the least expenditure of ammunition.

The attack will continue until at least three (3) hits with the 250 or 300-lb. bombs have been made; two (2) hits with the 550 or 600-lb. bombs; and two (2) hits with the 1,000-lb. bombs or bombs of heavier charge.

The Army are authorized to make at least two (2) hits with the largest type of bomb that may be available. This is a 2,000-lb. bomb.

Secrecy Concerning Results

The following quotation from a recommendation of the Joint Board approved by the Secretary of the Navy is brought to the attention of all concerned and strict compliance therewith will be required:

"That the results of these experiments and the conclusions drawn therefrom be held secret by the War and Navy Departments until passed upon by the Joint Board, and that all officers concerned in making these experiments be instructed accordingly."

(Signed:) HENRY B. WILSON

Army Obtains Navy Dornier All-Metal Plane

The Army Air Service has purchased from the Navy, one Dornier type D-1 all-metal single seater airplane for $9,000.00. Delivery of the machine is to be made to the Engineering Division McCook Field, Dayton, Ohio, where it is understood it will be used for experimental purposes.

The Cost of Aircraft Insurance

By E. S. Martin

Home Insurance Co.

Insurance is an important factor in almost any business and is probably of utmost consideration in the advancement of the aeronautical industry because of the admitted hazards of flying.

Insurance companies writing this class of business are confronted with a serious problem in their endeavor to offer coverage at rates which will invite operators of aircraft to seek protection.

The lack of federal control in the licensing of pilots, inspection of planes for their airworthiness, and laws to regulate flying is a serious obstacle, and not only tends to keep insurance rates high but holds back the progress of civil aviation.

Experience compiled for the year of 1920 covering aircraft business written by the insurance companies showed a loss ratio which ran into many thousands of dollars above the premiums collected, proving thereby that the rates were not nearly adequate to cover the risk. Aircraft underwriters realized that an increase of rates would tend only toward a poorer selection of business and were compelled to consider ways and means to decrease the loss ratio from another angle. An inspection of each individual risk, although advisable, is an enormous undertaking and could only be accomplished by a great additional cost to the business. By reason of the fact that so few companies are writing aircraft coverage, this service cannot be effected at present, although plans for its construction are being laid.

Why cannot the insurance companies discriminate between the reputable concern using first class machines operated by experienced pilots over favorable territory, and the pilot using a single machine which has been carelessly rebuilt and is flown from a poor airdrome? This question is constantly being raised.

Until an absolute check-up of the actual conditions surrounding each risk can be made, underwriters can only judge its merits by the application which is submitted covering the plane and statement called for showing the ability of the pilot who will operate. In a great many cases conditions are stated incorrectly, and were it possible for the insurance companies to determine the true facts in each case much of the business would be promptly declined.

An actual example which recently occurred is only one of many like it. One of the large insurance companies was asked for immediate coverage on a type of plane which is generally flown. The applicant advised that the plane had been purchased after a thorough overhauling and rebuilding by one of our aircraft manufacturers; and would be flown from a good airdrome by a capable pilot. When an inspection was made of the machine the next day, it was found unsafe to fly. In addition to its general rundown condition, three ribs were broken and badly patched, the fabric was nearly falling off, and no care had seemingly been taken to keep the wires clean from rust although the machine was constantly exposed to the weather. The airdrome itself invited a crash. Without motor failure and with perfect air conditions, take-offs and landings might be made for some time without accident. This machine is still in operation.

How can the insurance companies discriminate under these circumstances? If the insurance rates are high, it is not the fault of the companies who are writing it. Their power to prevent accidents is limited to the liability under their policy forms. Only slight heed is taken of advice by insurance companies governing careful operation. Rates for aircraft coverage will decrease just as soon as severe penalties are imposed for lax operation. Every airplane which is flown should have a certificate of airworthiness issued after having been thoroughly inspected. Pilots should not be allowed to fly until they have qualified for a license; and strict laws governing flying should be enforced. Every accident should be investigated and dealt with accordingly. Public vehicles are not allowed to dash through the streets regardless of public safety. Neither should aircraft be permitted to fly at altitudes insufficient to warrant a safe landing in case of necessity.

The insurance companies do not welcome high rates. Even with the handicaps they have had to encounter, some strides have been made in the right direction. If an insured pilot meets with an accident through carelessness a record of this is sent to the National Aircraft Underwriters Association and from there is reported to the insurance companies. That pilot is either barred from further insurance or is graded so low that it can only be obtained at a very high rate. Unless a reliable civilian board of inquiry is appointed to determine the cause of accidents the National Aircraft Underwriters Association is contemplating taking the matter in hand. Again this board would only have power to bar the operator from further insurance and could not administer a just penalty. The refusal of insurance companies to accept undesirable risks does not necessarily hinder further operation of machines.

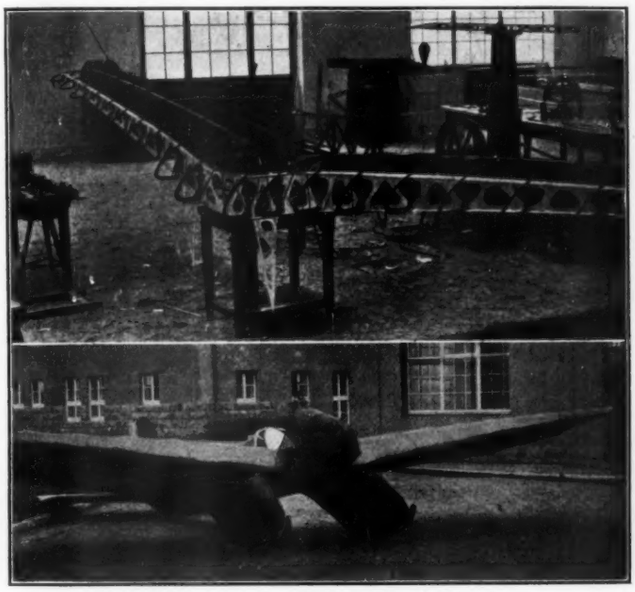
Suggestions for the safe operation of aircraft are easily made, but the urgent need at this time is united and immediate action by the industry, and those interested, to draft laws and put them into effect.

Soaring and Gliding Experiments in Germany

By Stanley Yale Beach

For over a year Germany has been pursuing experiments with gliding and soaring machines and the results obtained are so interesting that a few words on the subject may not be amiss. The interest taken in this art by Germans is attributed to the destruction of aeronautical material made compulsory by the treaty of Versailles.

Last summer in the Rhon district of western Germany a gliding and soaring competition was held for the first time by the League of German Model Aircraft and Glider Clubs. The event was considered of sufficient importance by the authorities to obtain the support of the German air ministry, and various aircraft manufacturers and aeronautical organizations also contributed their support.



TOP: WING SKELETON OF THE AACHEN GLIDER. BOTTOM: CLOSE-UP OF THE MACHINE

The following brief account gives a good idea of the machines which competed and of their performances.

The monoplane entered by the Aachen Aeronautical Society and designed by Engineer Klemperer, was a rigid cantilever wing affair, based on Junkers airplane practice, but not of metal construction like that machine. The wing, the front part of the body, and the undercarriage, are built up as a single unit of plywood girderwork, the tail and the rear half of the fuselage forming another unit. The undercarriage consists of a pair of sprung skids, supported beneath a pair of streamlined "trousers" which project from the wings. The span was 30 ft. and the wing area 172 sq. ft., while the weight empty was but 125 lb.

The monoplane entered by Senator Zeise, of Hamburg, was a machine of the Zanonia leaf or Taube type, with one rigid strut from the fuselage to the wing. The wings are built up on a frame of bamboo, great flexibility being aimed at. Control is effected by warping the wing tips, which are used for lateral, longitudinal and directional steering. Behind the main wings is fitted a smaller pair, also of very flexible construction and arranged to flap by the action of the pilot's feet on a set of pedals. The main landing shocks are taken by the pilot's legs, which project, during landing and starting, down through the bottom of the body. In order to soar with this machine, a speed of from 26 to 30 m.p.h. is required.

Eugen von Loessel's machine was a normal type of fuselage biplane with warping wings. On August 8, 1920, von Loessl covered a distance of 1295 ft. in soaring flight against a wind of 14 m.p.h. The next day he started against a wind of 20 m.p.h., and had been in the air one-and-one-half minutes when the elevator broke, and von Loessl was killed in the fall.

Richter and Hauenstein entered a normal biplane gliding machine, which was badly damaged after some early flights. A biplane belonging to the Nuremburg Pilot Preparatory School, in which the pilot hung from the lower wings in the ancient style of the earliest gliding enthusiasts, also competed. This glider weighed but 33 lb. Glides up to 1706 ft. were accomplished, which is more of sporting than of scientific interest in soaring flight.

A world's distance record was made by Engineer Klemperer's cantilever-wing Aachen monoplane, when it covered a distance of 6006 ft. on Sept. 6, 1920, while it made a duration record of 2 min., 22 3/5 sec. the following day. These were the best records for duration and distance made last year.

THE AACHEN GLIDER SOARING ON AN EVEN KEEL

This first gliding and soaring flight competition is to be followed by a similar event this year, which will be held under the patronage of the "Wissenschaftliche Gesellschaft für Lurftfahrt" (Scientific Society for Aeronautics) of Berlin, and will be managed by the League of German Model Aircraft and Gliding Clubs.

The object of these competitions is the experimental development of flight by the aid of the internal forces of the wind, that is, soaring flight. The subject has very considerable scientific and a distinctly sporting interest, and it is by no means certain that the results obtained will be of no practical value for civil passenger aircraft development.

It is desired to insure, as far as possible, that continued progress be made in the art of soaring flight, and at the same time to encourage the sporting interest in the competition. This year's meeting is to take place in August at the "Wasserkuppe", the place where the first competition was held.

It is proposed to award the first prize of 30,000 marks for the longest duration flight exceeding five minutes, the difference of elevation or loss of height permissible being not over 164 ft. This means the prize will only be awarded in case a substantial increase is made over the 1920 record. Other prizes will be awarded for the greatest distance flown, for the least drop in covering it, etc. A total of 100,000 marks prize money is available.

Believing that international cooperation will lead to a more rapid and complete solution of soaring flight, the promoters have decided that this contest shall be open to all nationalities,

and would-be competitors can obtain full information as to the conditions of entry from the offices of "Rhon-Segelflug-Wettbewerb 1921", at Frankfurt-on-Main, Bahnhof-platz 8.

Recent experimental work with gliders in Germany has produced some remarkable results, particularly tests made by Peschke and Werk in the Black Forest, and by Herr Harth, who has made flights of 5½ min. duration, with very slow rates of descent. It is, therefore, expected that the 1921 competition will produce really progressive results. The interest taken in this art in Germany is the direct result of the destruction of aeronautical material made compulsory by the Treaty of Versailles. Deprived of motor-driven aircraft, enthusiasts have taken up a branch of aeronautics for which others have no time to spare.

Aircraft Owners of Pennsylvania

The assistance of the Aero Club of Pennsylvania has been requested by the Adjutant General of the Pennsylvania National Guard and by Major A. L. Sneed of the Third Corps Area, Fort Howard, Md., in compiling a complete list of aircraft (lighter-than-air and heavier-than-air) privately owned within the State of Pennsylvania.

All owners of aircraft, both planes and balloons are requested to assist in compiling this list and are requested to send their name, address and full particulars. Prompt response will be greatly appreciated and will undoubtedly bring news of much interest in return. Address all communications to W. H. Sheahan, 1st Vice President, Ae.C.Pa., Carol Boulevard, Highland Park, Upper Darby, Pa.

Henry Deutsch de la Meurthe Aviation Cup

Mme. Henry Deutsch de la Meurthe and her family have decided to offer, in memory of M. Henry Deutsch de la Meurthe, a sum of 200,000 francs for an international speed contest to be called the Henry Deutsch de la Meurthe Cup.

The cup will be contested under the conditions laid down in the present regulations which have been drawn up at the request of the donors, and with their approval, by the Commission d'Aviation of the Aero Club de France. The Commission d'Aviation is responsible for the organization of the contest.

Prizes

The sum of 200,000 francs will be distributed as follows:

(A) A trophy of 20,000 francs.

(B) Three prizes of 60,000 francs each to be awarded to the winners of the cup, in accordance with the present regulations.

General Conditions

The contest will be an international challenge open to all machines of class C (flying machine with engine). It will consist of a speed test over a distance of about 300 km. Each year before May 1 the Commission d'Aviation of the Aero Club de France, taking into account the progress in aviation, shall publish the special regulations for that year.

Qualifications of Competitors

Every qualified national federation shall signify to the Aero Club de France its willingness to contest the cup. This notification must reach the secretary of the Commission d'Aviation of the said club before the date fixed by the special regulations for the year.

This entry must be accompanied by a sum of 1,000 francs for each machine, 500 francs being returned in respect of each machine crossing the starting line in flight. The entrants of each nation shall be the constructors of the machines, and shall not be approved unless presented by a national federation affiliated to the Fédéation Aéronautique Internationale.

Each national federation shall not present more than three entrants (that is, three machines in all).

The entrants and pilots in charge of the machines must be of the same nationality as the federation presenting them, or belong to a country not represented on the Fédération Aéronautique Internationale, the countries that were at war with France from 1914 to 1918 being excepted, unless they are members of the League of Nations.

Date and Place of Contest

The cup will be contested each year on a date and at a place fixed by the special regulations for the year.

Award of the Cup

The national federation recognized by the Fédération Aéronautique Internationale whose representative has won the cup shall be the provisional holder until the following award has been made. The trophy shall remain in the hands of the Aero Club de France until the final award has been made.

The permanent holder of the cup shall be the competitor who has twice won the contest, or failing that, the third winner. In the event of the first two contests being won by the same competitor, this competitor, having become the permanent holder of the cup, shall at the same time receive the remaining two prizes of 60,000 francs.

Entrants are responsible for all accidents to themselves and their personnel, as well as for damages of any kind to third parties, officials, etc., caused by their machines, pilots, workmen or themselves.

To satisfy administrative and customs requirements, competitors must send to the Commission d'Aviation de l'Aero Club de France on a date to be fixed by the annual regulations the following information (failure to do so may prevent the competitor taking part in the contest):—

1. Value of each machine.
2. Name and address of the pilot of the machine, also name and address of the substitute, it being permissible to change the first pilot if necessary.
3. Name or number of machine.
4. Type of machine and engine.
5. Weight and material of wings.
6. Weight of engine.
7. Weight of propellers.
8. Country of origin.

Supplementary Regulations for 1921

The contest will take place over 300 km. in the circuit Villesauvage-La Marmogne (the course of the Gordon Bennett Cup, 1921). Alightings, repairs and replenishments are allowed. The contest will take place on Oct. 1, 1921.

Entries presented by the national federations must reach the Commission d'Aviation de l'Aero Club de France before 6 p. m. on Aug. 27, 1921. Machines must be on the airdrome at Villesauvage before 4 p. m. on the day before the contest, viz., Sept. 30, 1921.

Competitors must send to the secretary of the Commission d'Aviation before 6 p. m. on Aug. 27, 1921, the information required above.

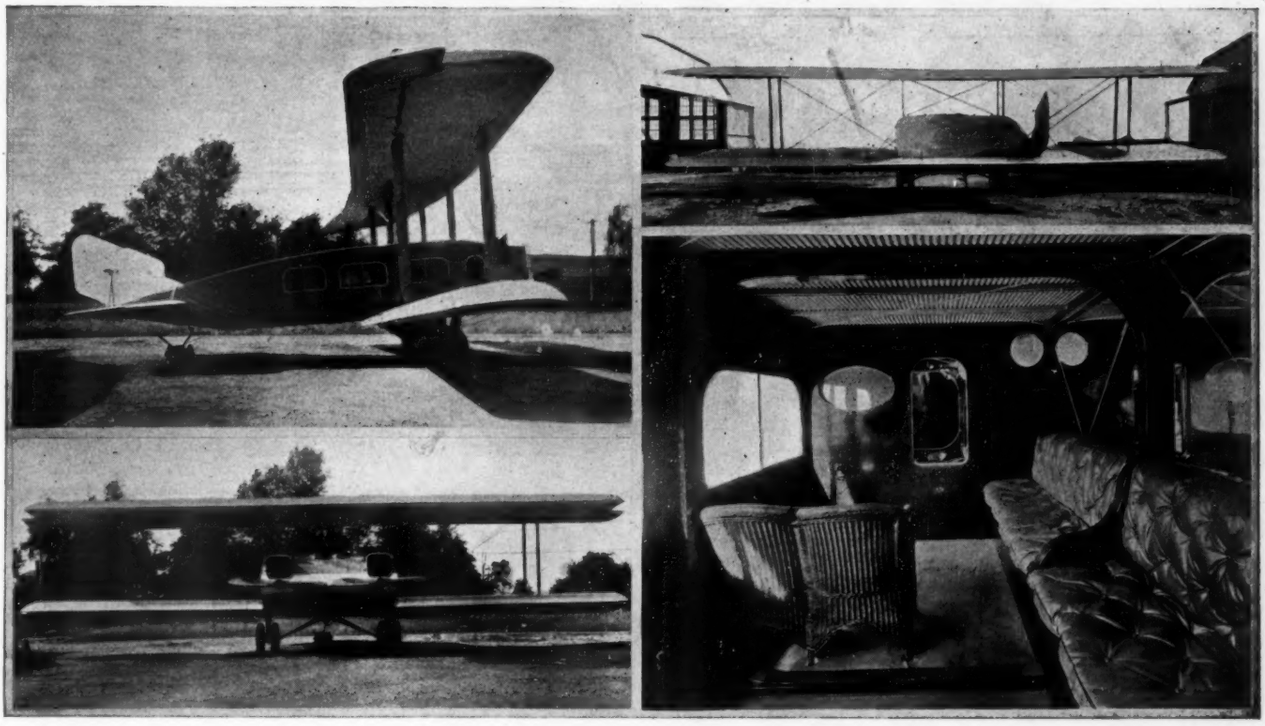
Each entrant must nominate, by a declaration in writing to be handed to the Commissaires Sportifs before 6 p. m. on the day before the contest, a person to represent him on the course. This person shall declare the time of departure. The contest shall be open from 9 a. m. to 6 p. m. During this period of nine hours, starts shall be made at times chosen by the competitors, as follows:—

Each entrant or the person accredited by him, shall inform the Commissaires Sportifs of his intention of starting, indicating the time at which he wishes to start. The Commissaires Sportifs shall then hand to him a slip fixing the time of starting, after which 30 min. will be allowed to the competitor to cross the starting line in flight.

If after the expiration of this time the competitor has not crossed the starting line in flight, he will be obliged to make a second and final request to start and the same precedure will be followed as for the first request, except that the expiration of the second 30 min. the competitor will be considered to have started.

All communications regarding this contest should be addressed to the Secretary of the Aero Club of America, 1[illegible] East 38th Street, New York.

A Distinctive Design: The Airliner



VIEWS OF THE LARGE CABIN AIRPLANE BUILT BY THE AIRLINER ENGINEERING CORP. THE LOWER RIGHT HAND VIEW SHOWS ONE-HALF OF THE CABIN ONLY

The above illustrations represent various views of the large commercial airplane which was built by the Airliner Engineering Corp., New York, and which has just been completed. The machine embodies a great number of original ideas which give it a distinctive appearance. Chief among these is the great width of the fuselage, which may be visualized from the view showing one-half of the cabin. The fuselage is 15 ft. wide in front and is built on the shape of an aerofoil; it thus contributes to the lift of the machine. The power plant is composed of two Liberty XII 400 hp. engines driving tractor propellers. Owing to the width of the fuseage it was possible to house both engines in the nose instead of mounting them in separate wing nacelles. A great deal of parasite resistance was thus done away with and the arrangement has the further advantage that it enables the mechanic to adjust the engines in flight.

Although no detailed description of the Airliner is as yet available, the following particulars will be of interest. The span of the machine, on both upper and lower wings, is 76 ft. The designed wing loading is 9 lb./sq. ft. and the aerofoil shaped fuselage contributes to the lift by carrying 5 lb./sq. ft. The weight empty is about 8600 lb. and the possible gross weight is estimated at 14,500 lb. The normal fuel capacity of the machine is for a flight of 7½ hr., although more fuel can, of course, be carried if the number of passengers is reduced. Seating accommodation is provided for thirty passengers.

The fuselage is built up on three transverse plywood partitions and is covered with corrugated duralumin. The forward section houses two pilots, for whom a dual control set is provided, and the mechanics. The next two sections constitute the passenger compartment, which is fitted with comfortable cushioned seats. The rear section tapers in height but not in width to a horizontal knife edge and carries the tail unit. This consists of a horizontal stabilizer with a one-piece elevator and of two vertical fins and two rudders mounted on edges of the fuselage.

The wings are built in orthodox fashion, being fabric surfaced over a wooden framework, and carry balanced ailerons.

The landing gear consists of two V structures carrying rubber sprung twin wheels, which are stayed at the centerline of the fuselage by means of steel struts.

The test flights of the Airliner will take place shortly. A short trial flight was achieved on June 21, at Curtiss Field, Long Island, when Bert Acosta took up the machine after running the engines for a while on the ground and flew it to Mitchel Field, where he made a perfect landing.

The design of the Airliner is due Vincent J. Buranelli, chief engineer of the Airliner Engineering Corp.

DH-4B Succors Disabled Sub-Chaser

U. S. Marine Corps Headquarters has received the following report from Headquarters, 4th Air Squadron, Port au Prince, Haiti:

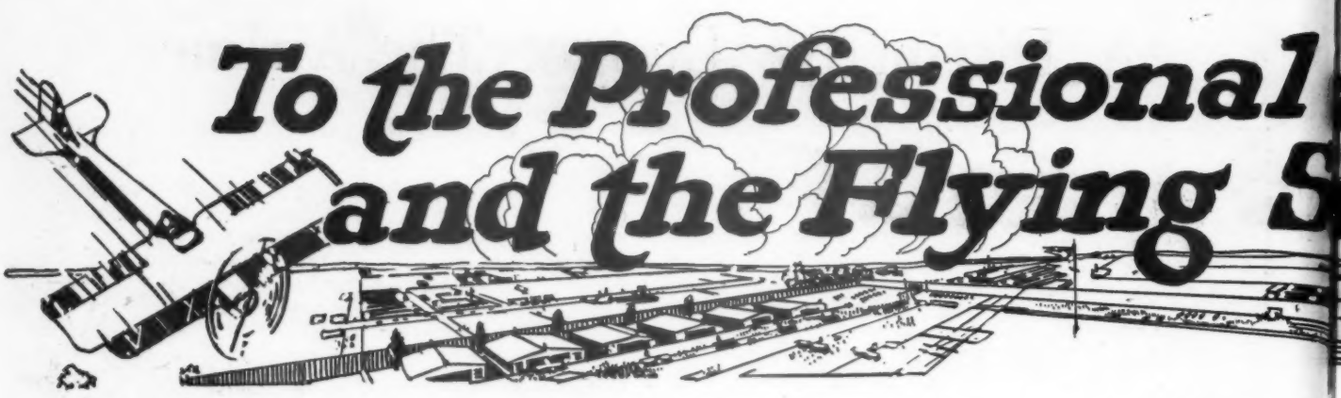
"On Sunday, May 29, 1921, one of the submarine chasers attached to the 1st Provisional Brigade broke down at Aux Cayes, enroute to San Domingo City, and it became necessary to take an engine weighing over 90 lb. to that place. On account of the rainy season the roads were impassible and there being no landing field the package was finally delivered by a DH-4B plane piloted by Second Lieutenant Kenneth B. Collings with Gunnery Sergeant Guy B. Smith as observer, in the following manner.

"The engine part was boxed and the box wrapped in canvas and securely fastened. Then 30 ft. of wire cable was attached, to the end of the cable a 5-gal. oil can, which had been made airtight, was fastened.

"The airplane first dropped a message on the subchaser stating how the package would be dropped and then dropped the package with attached buoy just off shore. The arrangement worked perfectly, the package sinking in about 10 ft. of water and the buoy marking the spot.

"The entire trip took 3 hr. 30 min. flying time from Port au Prince."

To the Professional and the Flying So



Never before and probably never again will the individual, the school or the company interested in aeronautics have the opportunity to purchase aeronautical equipment under such favorable buying conditions as those offered by this War Department sale. Surely such material has never been offered or ever will be offered again at such attractive prices.

Just an instance of the great values offered lies in the range of prices on aeronautical engines--a new engine as low as $100: Think of it! Practically every type of engine is included and twenty-four different domestic and foreign

ENGINES

5742 Aeronautical Engines of the following makes; Anzani, Benz, Bugatti, BR-2, Clerget, Daimler, Fiat, Gnome, Hall-Scott, A-7A Big Four type, Hispano-Suiza, Lawrance, L-Aviator, Le-Rhone, Liberty (both 8 and 12 cylinder types), Maybach, Mercedes, Oberursel Frankfort, Opel, Pougeot, Renault, Sturtevant, Thomas-Morse, Wright, Salmson.

Prices on the engines, except Liberty "Twelves" range from $100 to $600.

Engines in fair condition at lower figures INVESTIGATION

PLANES

A total of 111 planes are offered in this sale. The following makes are represented; Glenn Martin, Halberstadt Biplane, Nieuport, L. V. G., Pfalz, Pomillion, Poland, Rumpler, Standard, Sturtevant, Sopwith. While many are unserviceable and fit only for experimental and instruction purposes, some are complete with engines and can be made serviceable by overhauling.

Prices range as follows for single planes: $100, $150, $200, $250 and up to $1000. Catalog gives complete description, prices, etc.

SEA SLEDS

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U.S. AIR SERVICE

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Air Service

War Department

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Washington, D. C.

...ES ARMY

...TICAL EQUIPMENT

"Who's Who in American Aeronautics"

(Copyright, 1921, by The Gardner, Moffat Co., Inc.)

Every week, AVIATION AND AIRCRAFT JOURNAL prints the biographical sketch of men who are prominent in American Aeronautics. These sketches will be published later in pamphlet form. As so many of the officers change their stations often, it is believed that a semi-annual issue will be necessary. In compilations of this character many errors and omissions occur. It will be appreciated if corrections are sent to "Who's Who" Editor.

Leon Brewster Lent

LENT, LEON BREWSTER, Mechanical Engineer; born, Brewster, N. Y., July 22, 1876; son of Leander B. Lent and Rosetta (Brewster) Lent; married, Elizabeth M. Smith, Nov. 21, 1906.

Educated: Brewster grammar and high schools, Stevens Institute of Technology, M. E., 1897.

Professional: Extensive engineering experience from August 1897 to June 1917; including,—Associate Editor, "Power"; Steam and Gas Power plant design, construction and operation; design and construction of motor fire engine and also airplane engines.

Aeronautical Activities: 1917, development work on airplane engines; Aug. 1917 to May 1918, experimental engineering and flying at Langley Field; May 1918 to Nov. 1918, organized, equipped, and operated, field, hangars, repair shops at Camp Vail and also did flying for radio experiments; Nov. 1918 to May 1919, flying at Brindley, Roosevelt and Hazelhurst Fields; Jan. 1920 to March 1921, incidental flying with Air Mail Service including first transcontinental reconnaissance trip from New York to San Francisco and Los Angeles; General Superintendent of Air Mail Service from Jan. 1920 to Oct. 1920; Chief Engineer of Air Mail Service from Oct. 1920 to March 1921.

Flying Rating: Reserve Military Aviator, May 1, 1918.

War Service: Commissioned Captain, June 11,1917 and ordered to duty at Curtiss plant, Buffalo, N. Y. on development of Curtiss-Kirkham engine; Aug. 1917 to May 1918, Engineer Officer at Langley Field, Va.; May 1918 to Nov. 11, 1918, in charge of all aviation work at Camp Vail, N. J.; commissioned Major, A. S. A., Aug. 12, 1918; Nov. 1918 to May 1919, in command of Brindley Field and Roosevelt Field, discharged from army, Oct. 11, 1919.

Member: American Society of Mechanical Engineers; Engineers Club, New York City; Aero Club of America.

Present Occupation: Mechanical Engineer.

Address: Engineers Club, New York City; home, 23 Cottage Place, White Plains, N. Y.

John Chilton W. O'Donnell

O'DONNELL, JOHN CHILTON W., Major, Air Service; born, Baltimore, Md., Nov. 9, 1887; son of Eugene W. O'Donnell and Ann (Chilton) O'Donnell; married, Delphine Rains, July 16, 1919.

Educated: B.S., Loyola College, Baltimore, Md.; Fordham University.

Professional: Commissioned 2nd Lieut. of Cavalry, Nov. 1912 and assigned to 11th U. S. Cavalry; detailed in Aviation Section, Signal Corps, 1915.

Aeronautical Activities: Served with American Punitive Expedition in Mexico, 1st Aero Squadron, Aug., 1916 to Feb., 1917.

Flying Rating: Junior Military Aviator, 1916; Military Aviator, 1919.

War Service: Officer in Charge Flying, Kelly Field and Selfridge Field, 1917, Ellington Field, 1918; part of this time was Commanding Officer; Corps Air Service Commander, 3rd Corps, 3rd Army, Jan. to April 1919.

Member: Baltimore Club; Sons of Revolution.

Present Occupation: Major, Air Service, U. S. Army.

Address: c/o Adjutant General of the Army, Washington, D. C.

Ray S. Miller

MILLER, RAY S., Commercial Aviator; born, Van Wert, Ohio, Aug. 14, 1891; son of John N. Miller and Anna B. Miller.

Educated: Public schools of Van Wert, Ohio; one year, Fremont College, Nebr.

Professional: Manager, family estate, 1909-1916; 1916-1921, Civilian and Army Aviator.

Aeronautical Activities: Civilian flier, 1916-1917; army flier, 1917-1918; Chief Pilot for Curtiss N. W. Airplane Co., 1919-1921.

Flying Rating: Reserve Military Aviator.

War Service: Army, Dec. 1917 to March 1919.

Present Occupation: Chief Pilot for Curtiss N. W. Airplane Co.; Maj. in Command, Minn. National Guard Aero Squadron.

Address: 707 Met. Bank Bldg.; home, 3133 Calhoun Blvd., Minneapolis, Minn.

Thomas DeWitt Milling

MILLING, THOMAS De WITT, Major, Air Service; born, Winnfield, La., July 31, 1887; son of Robert E. Milling and Ida (Roberts) Milling.

Educated: Public schools of Franklin, La.; U. S. Military Academy.

Professional: 1909, U. S. Military Academy; 2nd Lieut., 15th Cavalry, Sept. 1909 to April 1911; on duty with Aviation Section, Signal Corp, as 1st Lieut., Captain, and Major, to Aug. 1917; Lt. Col. and Col., Air Service to April 1920.

Aeronautical Activities: On continuous aeronautical duty since April 1911; received instruction in flying at Wright School, Dayton, Ohio, 1911; assisted in establishing First Army Aviation School, College Park, Md., 1911; instructor in flying, 1911, 1912, and 1913; entered International Meets, Boston and New York, 1911, broke world's endurance record, carrying two passengers, also won Tri-State Race, one of the longest cross-country events at that time; successfully conducted tests in the observation of artillery fire from airplane, using both radio and dropped messages, at Fort Riley, Kansas, 1912; served with the First Aviation Detachment, stationed at Texas City, Tex., for expected service in Mexico, 1913; established a new American Air Service distance and endurance record, with passenger, by making a non-stop flight at San Antonio, Tex., distance 220 mi., return flight made in same manner, 1913; Officer in Charge of flying training, Army Aviation School, San Diego, Calif., 1913; on duty in France, Germany, Autria, and England, attending foreign aviation schools and studying aeronautical conditions in Europe, fall of 1913, spring of 1914; served with First Aero Squadron, Galveston, Tex., 1914; commanded Aviation Detachment on Mexican Border, Brownsville, Tex., 1915; Officer in Charge of flying training, Army Aviation School, San Diego, Calif., 1914 and 1915; served with First Aero Squadron, Fort Sill, Okla. and San Antonio, Tex., 1915; conducted tests on first automatic camera from airplane, 1915; Officer in Charge of flying training, War Department, 1916-1917; organized first flying school for instruction of Reserve Military Aviators, 1916; Chief of Air Service Training, A. E. F., 1917; member of Training Section, General Staff A. E. F., 1918.

Flying Rating: Pilot's Certificate No. 30, July 6, 1911; Expert Aviator's Certificate No. 3, Sept. 1911; first Military Aviator, U. S. Army, July 5, 1912; Junior Military Aviator, July 22, 1914; Military Aviator, Aug. 8, 1917; Airplane Pilot, Oct. 5, 1920.

War Service: Chief of Air Service Training, A. E. F., Sept. 3, 1917 to Jan. 3, 1918; member of Training Section, General Staff, A. E. F., to June 4, 1918; Commanding Officer, American Air Service Units, Toul Sector, to Aug. 24, 1918; Chief of Staff, Air Service, First Army, to Oct. 18, 1918; Chief of Air Service, First Army, to Jan. 25, 1919; returned to U. S., Feb. 1919; Assistant to Chief of Training and Operations, Air Service, March 1919 to June 1920; Officer in Charge, Air Service Field Officer's School, 1921.

War Honors: Awarded Distinguished Service Medal; Chevalier of the Legion of Honor, by France; Officer of the Order of Leopold, by Belgium.

Member: Chevy Chase Club; Racquet Club; Army and Navy Club ,(Wash.); Aero Club of America; Society of Automotive Engineers.

Present Occupation: Officer in Charge, Air Service Field Officers School, Langley Field, Va.

Address: Langley Field, Va.

Vernon L. Burge

BURGE, VERNON L., Captain, Air Service; born, Fisher, Ill., Nov. 29, 1888; son of A. T. Burge and Sarah Burge; married, Mary Kraske, Sept. 13, 1920.

Educated: High school and prep. schools.

Aeronautical Activities: Began flying in 1912, Wright Pusher in Philippine Islands; first enlisted man to fly in Army; completed pursuit course at San Diego; commanded bombing squadron at Ellington and Kelly Fields; instructor in flying during war.

Flying Rating: Certificate 154, F.A.I.; Junior Military Aviator; Airplane Pilot.

War Service: In service since 1907.

Present Occupation: Captain, Air Service, U. S. Army.

Address: Air Service Communications School, Ft. Sill, Okla.; home, West Lebanon, Ind.

Hiram Bingham

BINGHAM, HIRAM, Prof. of Yale University; born, Honolulu, Hawaii, Nov. 19, 1875; son of Rev. Hiram Bingham, and Minerva Clarissa (Brewster) Bingham; married, Alfreda Mitchell, Nov. 20, 1900.

Educated: Punahou Preparatory School, 1883-1888; Oahu College, 1888-1892; Phillips Academy, Andover, 1892-1894; A. B., 1898, Yale University; M. A. 1900, University of California; M. A. 1901, Ph. D. 1905, Harvard University.

Professional: Taught History at Harvard, 1902-1905; History and Politics at Princeton, 1905-1906; South American History at Yale, 1907-1917; exploring expedition across Venezuela and Colombia, 1906-1907; across Argentina, Bolivia and Peru, 1908-1909; U. S. Gov't. Delegate to Pan. American Scientific Congress, Chile, 1908; expeditions to Peru for Yale and National Geog. Society, 1911, 1912, and 1915.

Aeronautical Activities: Curtiss School, March and April, 1917; pilot's license, April 1917; organized U. S. Schools of Military Aeronautics and O. I. C., May to Nov., 1917; O. I. C., Air Personnel Division in O. C. S. O.; Chief of Personnel in O. C. A. S., A. E. F., 1918; C. O. of 3rd A. I. C. (Issoudon), 1918; on duty in O. D. M. A.; Washington, Jan. to March, 1919.

Flying Rating: Reserve Military Aviator.

War Service: Aero Engineer in O. C. S. O., 1917; Commissioned Major, S. O. R. C., June 1917; Commissioned Lt. Col., A. S. S. C., Oct. 1917.

War Honors: Officer Ord de Etoile Noire (French decoration).

Books: "Five Straws"; "Journal of an Expedition Across Venezuela and Colombia"; "Across South America"; "The Monroe Doctrine An Obsolete Shebboleth"; "Vitcos", the Last Inca Capital"; "The Wonderland of Peru"; "An Explorer in the Air Service".

Member: American Flying Club; University Club of New York; Yale Club of New York; Cosmos Club; Chevy Chase Club; Elizabethian Club; Country Club of New Haven; Harvard Club of Boston.

Present Occupation: Prof. of Latin American History at Yale University.

Address: Drawer A, Yale Station; home, 787 Prospect St., New Haven, Conn.

James Otis Lewis

LEWIS, JAMES OTIS, Commercial Aviator; born, Waco, Tex., June 24, 1894; son of Thomas E. Lewis and Minnie (Britton) Lewis; married, Myrtle M. Kemper, July 9, 1914.

Educated: Public and high schools of Ardmore, Okla.; Southeastern Teachers College, Durant, Okla.; University of Texas.

Professional: Teacher in public schools of Hollister, Mo. and Cumberland Okla., 1913-1917; Aviator, 1920-1921.

Aeronautical Activities: Student at Kelly Field and Brooks Field; instructor in flying (Gosport), 1918, at Souther, Park, and Calstrom Fields; Civilian flying, instruction and exhibition, Aug. 1918 to present.

Flying Rating: Reserve Military Aviator, June 1918.

War Service: U. S. Army, 1917 to Aug. 1919.

Member: Aero Club of America.

Present Occupation: Commercial Aviator.

Address: Mt. Vernon, Mo.

John Wesley Maxcy

MAXCY, JOHN WESLEY, Physical Instructor; born, Peru, Nebr., Feb. 20, 1894; son of John Wesley Maxcy and Delilah A. Maxcy.

Educated: Academy at McPherson College; A.B., McPherson College; Peru State Normal; Illinois State University.

Professional: Physical Director and Baseball Coach, McPherson College, 1915-1917, 1920.

Aeronautical Activities: S.M.A., Austin, Tex., Camp Dick, Barron Field, Post Field, 1917-1919; flying instructor, Barron Field; assistant engineering officer and chief test pilot, Post Field.

Flying Rating: Reserve Military Aviator, July 1918; Pursuit Pilot, March 1920.

War Service: As above.

Member: Aero Club of America.

Present Occupation: Physical Director, Potsdam Normal Training School.

Address: 7 Lawrence Ave., Potsdam, N. Y.

John Owen Donaldson

DONALDSON, JOHN OWEN, American Ace; born, Fort Yates, N. D., May 14, 1897; son of Col. Thomas A. Donaldson and Elizabeth (Wilson) Donaldson.

Educated: Central High School; traveled so much in early youth never attended public schools more than a year and half at a time; Furman University, S. C.; Cornell University, N. Y.

Aeronautical Activities: Ground school, Aug. and Sept. 1917; elementary and higher flying, Armour Heights, Toronto, Canada; school of aerial gunnery, instructor in flying, Ft. Worth, Tex.; school of aerial fighting in England; active service on the front beginning June 1918; transcontinental air race to San Francisco and return to New York, awarded second place; American Ace, officially credited with destruction of 8 enemy airplanes.

Flying Rating: Reserve Military Aviator, March 14, 1918; Military Aviator, Aug. 10, 1918.

War Service: July 6, 1917 to June 1920; on front from June to Sept.; taken prisoner Sept. and escaped into Holland, Oct. 23, 1918; promoted to 1st Lieut., Aug. 10, 1918; to Captain, July 1919.

War Honors: Distinguished Flying Cross; four citations for gallantry in action.

Member: Rotary Club; Aero Club of America.

Present Occupation: President of small corporation, San Antonio, Tex.

Address: 1167 Central Trust Bldg., San Antonio, Tex.; home, 1829 Kolorama Road, Washington, D. C.

William A. Pattishall

PATTISHALL, WILLIAM A., Attorney at Law; born, Geneva, Fla., March 21, 1896; son of H. H. Pattishall and Annie G. Pattishall.

Educated: Sanford (Fla.) High School, 1913; Columbia University, New York, 1913-1914; John B. Stetson University, DeLand, Fla., 1914-1917, B. S. 1917; LL. B. 1920, Stetson University.

Professional: Practice of Law since June 1920 in Orlando, Fla.

Aeronautical Activities: S. of M. A. Atlanta, Ga., Aug. 11, 1917 to Oct. 13, 1917; 2nd Av. Inst. Center Tours, France, Nov. 17, 1917 to Jan. 8, 1918; St. Maixant with the famous Beaumont Detachment of Cadets, Jan. 8 to March 29, 1918; hospitals, six month ending Aug. 28, 1918; third Av. Inst. Center, Issoudun, Sept. 17, 1918 to Jan. 10, 1919, where trained entirely on Nieuports.

Flying Rating: Reserve Military Aviator, Nov. 15, 1918.

War Service: U. S. Army, May 13, 1917 to May 7, 1919.

Member: College and Law Fraternities.

Present Occupation: Attorney at Law.

Address: Orlando, Fla.

Oscar Blair Myers

MYERS, OSCAR BLAIR, Engineer; born, Mount Vernon, N. Y., Oct. 3, 1894; son of S. Oscar Myers, M.D. and Frances (Merriam) Myers.

Educated: Grammar and high schools; Electrical Engineer, 1916, Columbia University, School of Engineering.

Professional: Telephone Engineer, 1916-1917; Gas Engineer, 1920-1921.

Aeronautical Activities: In addition to war service, two months in 1920 with N. A. P. S. Company, Providence, R. I., as pilot carrying passengers, taking aerial photographs and motion pictures.

Flying Rating: Breveted by Aero Club d'Italia, Jan. 1918.

War Service: American Air Service, June 1917 to Oct. 1919; in France, Sept. 1917 to Oct. 1919.

Honors: Distinguished Service Cross; citation, Sept. 28, 1918.

Member: Aero Club of America.

Present Occupation: Gas Engineer.

Address: Westchester Lighting Co., 1st Ave. and 1st Street; home, 109 South 3rd Ave., Mount Vernon, N. Y.

Harry Huber Haw

HAW, HARRY HUBER, Commercial Aviator; born, Greenwood, Wis., Jan. 10, 1894; son of John Haw and Clara (Perkins) Haw.

Educated: Public schools of Augusta, Wis.; A.B., 1918, College of the Pacific.

Professional: Bridge carpenter, Canadian Northern Railroad, 1913-1914; Business Manager, Pacific Weekly, 1915-1916; Undergraduate Manager, College Athletics, 1916-1917.

Aeronautical Activities: School of Military Aeronautics, Berkeley, Calif.; Pursuit Course, Carlstrom Field; Vice President and Engineering Officer, Fort Pierre Aero Co., S. D.; Pilot, Curtiss Northwest Airplane Co.; Pilot, Spaulding-Willett Airplane Co.; cross-country flights through a great many of the states and Canada and Mexico.

Flying Rating: Reserve Military Aviator.

War Service: Dec. 1917 to April 1919.

Present Occupation: Airplane Pilot.

Address: Spaulding-Willett Airplane Co., Osakis, Minn.; home, 1028 13th Street N., Fargo, N. D.

Clifford Ross Powell

POWELL, CLIFFORD ROSS, Lawyer; born, Lumberton, N. J., July 26, 1893; son of Spencer H. Powell and Florence (Ross) Powell; married, H. Irene Emery, Nov. 3, 1916.

Educated: Mount Holly, N. J. High School, 1911.

Professional: Lawyer, admitted to practice in New Jersey and Federal Courts in 1914; actively engaged in practice in Mount Holly, N. J. since that time.

Aeronautical Activities: Took Observers' Course at Cazaux, France, Feb. 1918; flew in Tours, France during latter part of March; joined French 9th Bombardment Group, April 1918; participated in major operations, Somme Defensive, Aisne, Oise-Aisne, St. Mihiel, and Meuse-Argonne, and various Defensive Sectors; Nov. 1918, became instructor in map reading, cross-country flying, etc. at 7th A.I.C., Clermont-Ferrand Bombing School.

Flying Rating: Aerial Observer, Feb. 1918.

War Service: July 1917 to Feb. 1919; in army since Feb. 1913.

War Honors: Citation conferring Croix de Guerre in Escadre 12, French Army (star); Citation conferring Croix de Guerre in French Army (palm): "since his arrival in the Escadrille has made every bombardment bravely at all times and under all conditions; on June 1, 1918, attacked by a group of enemy planes, he was severely wounded, his plane riddled with bullets, and the control wires cut, yet he did not advise his pilot of his wounds until a landing had been made. During the battle and after, he showed the greatest courage, and showed more interest in the results of the encounter than in his wounds. In the course of the combat he shot down an enemy plane." (Order No. 11054 "D" Oct. 30, 1918. Petain, Commander in Chief).

Member: 7th A.I.C. Association; American Legion.

Present Occupation: Lawyer.

Address: 117 Main St.; home, 139 High St., Mount Holly, N. J.

Harry W. Huking

HUKING, HARRY W., Pilot, Air Mail Service; born, Congers, New York, May 30, 1896; son of Leonard J. Huking and Catherine E. Huking.

Educated: Public school 128, New York, N. Y.; Manual Training High School; Cooper Union Institute.

Professional: New York Life Insurance Co., 1912-1917.

Aeronautical Activities: Mineola, L. I., Aug. 1917; Princeton Ground School, Nov. 1917; Primary Training at Rich Field; commissioned 2nd Lieut., March 1918; Flying Instructor, Brooks Field, Kelly Field No. 2; advanced training at Rockwell Field; Supply Officer, East Field; pilot on border patrol with 9th Aero Squadron; pilot, Air Mail Service, April 1920 to date.

Flying Rating: Reserve Military Aviator.

War Service: Army, Aug. 1917 to Sept. 1919.

Present Occupation: Pilot, Air Mail Service.

Address: Hazelhurst Field, Hempstead, L. I.; home, 159 Bay 35th St., Brooklyn, N. Y.

Junius Henry Houghton

HOUGHTON, JUNIUS HENRY, Captain, Air Service; born, Titusville, Pa., Aug. 21, 1892; son of Clifford Houghton and Josephine (Harris) Houghton; married, Mary Hazel Hahn, Dec. 13, 1917.

Educated: Titusville High School; U. S. Military Academy.

Professional: Cadet, U.S.M.A., June 13, 1911 to Jan. 1912; 2nd Lt. Inf., Aug. 1912 to June 1916; to July 1917, Capt. Cav.; 1920 to date, Capt., Air Service.

Aeronautical Activities: Student Officer, Rockwell Field, Aug. 1917; in charge of Pursuit Training, Carlstrom and Dorr Fields, Aug. to March 1919; 1st Pursuit Group at Selfridge Field and Kelly Field, July to Oct. 1919; Commanding Officer, Scott Field since Oct. 1919.

Flying Rating: Junior Military Aviator.

Present Occupation: Commanding Officer, Scott Field.

Address: Belleville, Ill.; home, Titusville, Pa.

Edward Carter Braxton Landon

LANDON, EDWARD CARTER BRAXTON, Automobile Business; born, Newport News, Va., March 11, 1896; son of W. H. Landon and Lizzie B. Landon.

Educated: Hampton High School, Hampton, Va.; Randolph-Macon College; University of Georgia.

Professional: Clerk, Old Dominion Steamship Co. and C & O Railway Co., Newport News, Va.

Aeronautical Activities: School of Military Aeronautics; Ohio State University; Oxford University; Royal Machine Gun School; School of Aerial Fighting and Gunnery, 1918; 135th Squadron, U. S. Air Service, Toul Sector, 1918.

Flying Rating: Reserve Military Aviator, 1920.

War Service: U. S. Air Service, 1917 to 1919.

Present Occupation: Salesman, Byrd Motor Co., Knoxville, Tenn.

Address: 816-818 Gay St., Knoxville, Tenn.; home, Boulevard, Hampton, Va.

John Fanz Staub

STAUB, JOHN FANZ, Architect; born, Knoxville, Tenn., Sept. 12, 1892; son of Fritz Staub and Anna C. Staub; married, Madeleine L. Delabarre, Oct. 4, 1919.

Educated: Knoxville public schools; B.S. 1913, University of Tennessee; B.S. 1915, M.S. 1916, Mass. Inst. of Tech.

Professional: Associated with H. T. Lindeberg, architect, for one year previous to war; returned to same firm, March 1919; to become junior member of the firm on July 1, 1921.

Aeronautical Activities: U. S. Naval Air Station, Killingholme, England, April 1917 to Dec, 1917; Ground School, M. I. T., Aug., Sept. 1917; Pensacola Aero Station, Oct. 1917 to Feb. 1918; Taliaferro Field, March 1918.

Flying Rating: U. S. Naval Reserve Flying Corps Pilot, No. 263; Hydroaeroplane Pilot Certificate, No. 164.

War Service: July 1917 to Jan. 1919; commissioned Ensign, U. S. N. R. F., Jan. 1918; commissioned, Lieut. (j. g.), Oct. 1, 1918.

War Honors: Citation: "For distinguished service in the line of his profession as a pilot of a seaplane, carrying out a large number of hazardous war patrol flights in the vicinity of enemy coasts with skill and daring; and especially on the occasion of the attack on a submarine on July 9, 1918, when as observer of the seaplane, he dropped bombs, which either destroyed or seriously damaged the submarine."; Navy Cross.

Member: American Institute of Architects.

Present Occupation: Architect.

Address: 2 West 47th St.; home, 1142 Madison Ave., New York, N. Y.

John Fred Nixon

NIXON, JOHN FRED, Airplane Pilot; born, Paterson, N. J., July 15, 1898; son of John James Nixon and Katherine (Lawler) Nixon.

Educated: Grammar school; Paterson High School.

Professional: Superintendent, By-Product Coke Plant, Paterson, N. J., year of 1919; airplane passenger carrying since April 1920.

Aeronautical Activities: Since 1920 has been operating own plane as passenger carrier. also some moving picture work for Pathe Exchange and giving flying instruction.

War Service: Graduate, Austin Ground School, U. S. A., May 1918; commissioned 2nd Lieut., U. S. Air Service, Sept. 1918; instructor, Carruthers Field, Ft. Worth, Tex.; attended Brooks Field instructors school, Jan. 1919; transferred to March Field, Calif. as instructor, April 1920.

Flying Rating: Reserve Military Aviator.

Member: Aero Club of America.

Present Occupation: Passenger airplane carrying and motion picture work.

Address: 139 Graham Ave., Paterson, N. J.

Burgess F. Creeth

CREETH, BURGESS F., Commercial Pilot; born, Los Angeles, Calif., July 14, 1895; son of Frederick G. Creeth and Ida S. Creeth.

Educated: Public schools of Hastings, Nebr. and Long Beach, Calif.; Hastings College; Colorado School of Mines, Golden, Colo.

Aeronautical Activities: Training received at 3rd A. I. C., A. E. F. on Nieuport; Instructor at 3rd A. I. C.; member, 5th Pursuit Group, 638th Spad Squadron; Snyder-Creeth Aero Co., Hastings, Nebr.; engaged in commercial and exhibition flying throughout middle west from Aug. 1919 to Jan. 1921.

Flying Rating: Reserve Military Aviator.

War Service: Army Air Service, Aug. 1917 to July 1919.

Member: Aero Club of America.

Present Occupation: Civilian flying; entering Air Mail Service.

Address: 1871 Lime Ave., Long Beach, Calif.

Theodore E. Hedlund

HEDLUND, THEODORE E., Newspaper writer; born, Worcester, Mass., March 5, 1890; married, Mary Frances Gallaugher, Aug. 10, 1918.

Educated: Worcester High School.

Professional: Editorial Departments, Worcester Telegram, 1909-1912; Boston Herald, 1912-1913; Boston Post, 1913 to present time; since the war has been Aviation Editor of the Boston Post.

Aeronautical Activities: School Military Aeronautics, Mass. Inst. of Tech., 1917; commissioned 2nd Lieut., March 12, 1918; night flying and bombing training, Ellington Field, Houston, Tex. from May to Aug. 1918; night flying on coast of England up to Armistice.

Flying Rating: Reserve Military Aviator.

War Service: Officers training camp, Plattsburgh, N. Y. 1917; then Air Service work and qualified as pilot at Park Field, Tenn.

Books: "How Man Learned to Fly."

Member: Organized and served as its first President, the Aero Club of Massachusetts.

Present Occupation: Aviation Editor, Boston Post, Boston, Mass.

Address: 81 Marion St., Brookline, Mass.

Active Aero Clubs

NOTE.—The clubs listed below which are marked with an asterisk (*) are affiliated with the Aero Club of America.

Aero Club, University of Minnesota

Minneapolis., Minn.

President, Carlos W. del Plaine; Vice President, Robert C. Murray; Secretary, George Meyler; Treasurer, Ivy Parks.

*Aviation Country Club of Detroit

309 Free Press Bldg., Detroit, Mich.

President, H. W. Alden; Vice President, Walter G. Nicholson; Secretary, Fred E. Hudson; Treasurer, C. G. Rowlette.

ADVISORY BOARD

Henry M. Leland, Col. Sidney D. Waldon, Col. J. G. Vincent, C. F. Kettering, Capt. Eddie Rickenbacker.

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Aero Miles City Club

Miles City, Mont.

President, H. B. Wiley; Vice President, Carl B. Calvin; Secretary, W. G. Ferguson; Treasurer, L. K. Hills.

DIRECTORS

H. B. Wiley, Carl B. Calvin, L. K. Hills, W. G. Ferguson, Earl T. Vance.

*Yolo Fliers' Club

Woodland, Calif.

President, Arthur C. Huston; Vice President, O. W. H. Pratt; Vice President, Jas. W. Monroe; Secretary, Emil K. Kraft; Treasurer, Floyd L. Tuttle.

DIRECTORS

Arthur C. Huston, Laurence Stephens, Robert L. Niemann, O. W. H. Pratt, Jas. W. Monroe, Harry S. Summers, Emil K. Kraft, Forrest A. Plant, T. D. Cummins, L. W. Scarlett.

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A Product of the West

JACUZZI COMMERCIAL MONOPLANE LEAVING MARINA FIELD, SAN FRANCISCO, DURING THE RECENT AVIATION MEETING

Two Man Altitude Flight

What is believed to be a new world's altitude record for pilot and passenger was made on May 6, 1921, by Lt. J. A. Macready with Roy S. Langham as observer, when he reached a corrected indicated altitude of 34,150 ft. above sea-level in a Lepere biplane equipped with a Moss supercharger. This airplane is the same one in which Major Schroeder made his world's altitude record, both for pilot alone and for pilot and passenger. The preliminary calibrations of the instrument and the computations were performed by the Flight Test Branch at McCook Field.

The instrument and data gathered on the flight will be forwarded to the Bureau of Standards for final checking before a world record is claimed. It will be remembered that on the occasion of Major Schroeder's altitude flight the Bureau of Standards computation of the results gave a figure more than a thousand feet higher than the preliminary computation performed at McCook Field. In view of this it is considered very probable that Lieutenant Macready has set a new record.

No difficulty was experienced by the pilot except the discomfort caused by the extreme cold at this high altitude and by the frosting of his goggles. Upon removing his glove in order to attempt to wipe ice from his goggles, his left hand became so stiff from cold that he lost the use of it until the warm air at low altitude restored the circulation. The engine and supercharger functioned very satisfactorily.

It should be noted that while the figure given above does not represent the true altitude above sea-level actually attained by the airplane ,it does represent the figure upon which altitude records are granted. The corrected indicated altitude is dependent solely upon the pressure of the atmosphere in which the airplane is flying, and if two airplanes attain the same corrected altitude on different days, which of the two airplanes reaches a higher true altitude depends on the temperature existing in the atmosphere between the airplane and the ground, and which is, of course, a matter of luck. It is for the purpose of eliminating the element of luck that the International Aeronautic Federation disregards true altitude in determining records, since it is obvious that, if one airplane reaches a higher corrected indicated altitude than another, (which means lower air pressure) it could out-climb the first airplane provided both were flown under identical atmospheric conditions. In order to obtain the correct indicated altitude, all the temperature and pressure corrections of the barograph used must be accurately known and carefully applied to the observed readings obtained on the flight. For this purpose elaborate temperature and pressure calibrating apparatus is required.

For purposes of comparison it will be remembered that Major Schroeder's corrected indicated altitude for the one man record was 38,180 ft. by the Bureau of Standards computation, and for the two men record was 33,350 ft. computed by the Flight Test Branch at McCook Field.

Packard Engine Test

The Engineering Division at McCook Field has recently completed a 50-hr. test of the first Packard Model 1237 engine delivered under a recent contract for twenty-five engines. This engine is a 12-cylinder, V type, having a bore of 5 in. and 5¼ in. stroke. The cylinder banks are set at an angle of 60 deg.

An interesting feature of this engine is the use of 6½ : 1 compression ratio which requires that the engine be throttled somewhat at sea level in order to prevent pre-ignition. As the altitude increases, the throttle is gradually opened until an altitude of 6,000 ft. is reached, when the throttle may be wide open. This arrangement gives a constant power output up to 6,000 ft. altitude.

The engine ran very well during the 50-hr. test and no major difficulties were encountered. The only points which seemed to require correction were the magneto coupling and the valve stem guides; the former appeared to be too flexible for satisfactory operation and the latter showed excessive wear in some cases.

This engine appears to be very well adapted to pursuit work as its power to weight ratio is very good and its operation appears exceptionally smooth and free from vibration.

The White Aerial Fleet

"The White Aerial Fleet"—this is how the public of Florida and Cuba came to call the luxurious cabin flying boats which the Aeromarine Airways, Inc., placed in service between Key West, Fla., and Havana last November, where they have been operating ever since without having to record a single accident. This enviable record, which the Aeromarine Airways owes as much to the excellent Navy surplus material from which its fleet was built up as to the skill and devotion of its flying and ground personnel, sufficiently explains the popularity the White Aerial Fleet has achieved among the flying public.

During the first six months of operation, ending June 1, the Key West-Havana service of the Aeromarine Airways Co. completed 162 flights, carrying 1,044 passengers with baggage and 24,042 lb. of mail.

In addition to this service the company maintained other services which bring the total number of flights up to 463, the total hours flying time up to 644, and the total nautical mileage up to 38,264.

With the coming of summer, when flying boat trips possess particular charm in our latitude, part of the Aeromarine fleet has been transferred to New York, while the other part still insures the daily mail and passenger service between Key West and Havana.

In addition to their well-known model F-5-L flying boat, which has accommodation for eleven passengers in two comfortable cabins, Aeromarine Airways have now placed in service a number of converted HS-2-L flying boats, which carry five passengers beside the pilot in open cockpits. These open boats are thus particularly desirable craft for summer sightseeing trips.

For the convenience of aerial travelers Aeromarine Airways has opened a booking office in the lobby of the Waldorf-Astoria Hotel, where boats of the White Aerial Fleet may be chartered for short flights up or down the coast or over the inland waterways, for all day use, or for a week or longer.

Paris-Warsaw Air Service

The Paris-Warsaw air service was successfully put in operation on April 12, by the extension to the Polish Capital of the Paris-Strasbourg-Prague service, which has been running for some months.

The first airplane to be employed on the new airway left Warsaw at 8 a. m. with a passenger and courier and mails. Alighting at Prague, the machine picked up a second passenger and additional mails. Le Bourget was safely reached at 6:30 p. m. The machine thus accomplished a flight of 875 miles in 10½ hrs., as against a minimum of 60 hr. required for the train journey.

Negotiations are now nearing completion for an airway from Berlin via Riga to Moscow, and when this service is running it will be possible to travel by air right through from London to Moscow, a distance of nearly 2,000 miles.

The existing London-Paris air service connects at Paris with the airway to Warsaw, which goes by the way of Strasbourg and Prague, while the Franco-Roumanian Air Service Co., who are responsible for this airway, have obtained concessions from the Austrian and Rumanian government and hope shortly to open an airway that will connect London through Paris with Constantinople.

Sadi Lecointe Signs up for Pulitzer Race

A cable dispatch to the Detroit Aviation Society states that Sadi Lecointe, winner of the last Gordon Bennett airplane race and present holder of the world's speed record, has signed an agreement to compete in the Pulitzer Trophy race, which will be the main event of the aviation meeting to be staged near Detroit from Sept. 8 to 10.

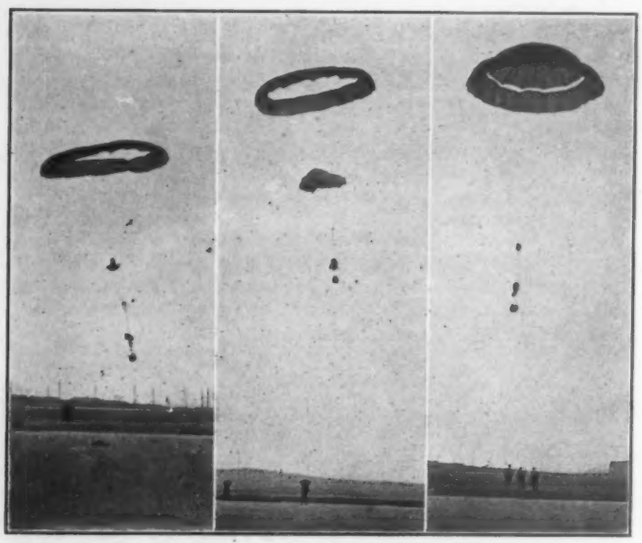
M. Lecointe is to sail for the United States in the middle of August with a substitute pilot. He will fly a Nieuport racing airplane equipped with a Hispano-Suiza engine. The world's speed record established by M. Lecointe is 189 m.p.h., but in recent trials, which were not officially timed, he is reported to have made a speed of 220 m.p.h.

New Types of Parachutes

By Dr. Alfred Gradenwitz

Toward the close of the war the German army authorities invited constructors to design a new type of parachute, which it was thought would be of the highest importance in the interests of aviation. The rules laid down to this effect comprised the adoption of 220 lb. as standard weight of a human body and the condition that the forces developed on unfolding the parachute should not exceed, say, 660 lb. The maximum speed of the machine from which the parachute descent was to be attempted was supposed to be 165 ft. per sec., (about 115 m.p.h.) the landing speed of the parachute and load never exceeding 13 ft. per second.

The firm Ballonhüllen-Gesellschaft, of Berlin-Tempelhof, thereupon set about commencing tests with a view to develop a parachute complying with these conditions. Supposing an ordinary parachute, designed for a load of 220 lb. and a landing speed of 13 ft. per sec., to unfold suddenly within prac-



DOUBLE STAGE PARACHUTE IN VARIOUS POSITIONS OF UNFOLDING

tically no time, and supposing further about 2 sec. to have passed from the jump from the airplane travelling at the speed of 165 ft. per sec. until the moment of unfolding of the parachute (during which time the absolute speed of the human body falling through space would have been braked down to, say 150 ft. per sec.). a wind pressure of about 17,000 lb. would have to be accounted for in the most unfavorable case, that is, a strain which none of the parachutes so far constructed would be able to stand. Though this strain never occurs in actual practice, the opening of the parachute not being instantaneous, possibly lasting but a fraction of a second, this much can be inferred from the above, that as the speed of the airplane increases, the jerks obtaining during the unfolding of the parachute are bound to increase in a dangerous manner.

In order to damp these jerks, Messrs. Ballonhüllen-Ges., on plans by Waldemar Müller and A. Heinen, adopted two different schemes, namely:

(1) Subdividing the parachute area into two sections of which only the outer one is caused to unfold immediately, the remainder not coming into play before this section has been allowed to exert its damping effect, (Figs. 1 to 3); and

(2) Leaving the parachute itself unchanged, that is, causing the parachute at once to unfold entirely, but inserting between the parachute and the load a brake, which latter begins to act as the parachute is unfolding and gradually absorbs the live force of the falling body.

Both these solutions have proved entirely practicable, the parachutes designed on these lines having, after some preliminary tests from a captive balloon, the roof of an airship hangar and on the ground, been subjected to severe tests in connection with the safety competition organized by the German Air Sport Committee under the auspices of the Scientific Society for Aeronautics. These tests, made on the Johannisthal airdrome, near Berlin, with airplanes of the Deutsche Luftreederei from a height of about 1000 ft., were rendered difficult by squally weather and low clouds. A doll of about 130 lb. weight and approximately human dimensions was hanging from each parachute.

The outstanding feature of the brake used in connection with one of the parachutes is the possibility of adjustment to a practically constant braking effect. As the parachute is opening, its speed in a fraction of a second decreases to landing speed, while the load suspended from the outfit, being checked by the brake, goes on on its relatively rapid course, until, being stopped with regard to the parachute, it eventually partakes of the slow downward motion of the latter.

In the case of the recent Johannisthal tests above referred to, this parachute was dropped from a machine flying at a speed of about 140 ft. per sec. The load suspended from it, in accordance with the above, weighed about 132 lb., the brake being adjusted to a braking effect of about 165 lb. The resulting braking distance was more than 65 ft., the braked live energy thus working out at about 17,000 ft. lb., which in the case of higher flying speeds and greater loads, of course, can be considerably increased. The parachute and brake were found to work to the full satisfaction of those present.

The other parachute, viz., the one working in two stages, comprised a ring-shaped outer surface allowed first to unfold, thus damping the first shock. As soon as this has been done, that is, a few seconds afterward, the second section is released automatically, thus rising on the interior ropes of the annular parachute section and completing a closed umbrella surface. This parachute likewise operated satisfactorily under the same conditions as above stated, in connection with the brake attachment.

It is intended eventually to develop these parachutes, converting them into devices suitable for bodily rescuing the entire airplane.

New Dayton Wright Wing

A new airplane wing capable of vastly increased speed and carrying capacity has been developed by the Dayton Wright Co.

Representatives of foreign Governments and several European aircraft manufacturers have recently visited Dayton, where Col. V. E .Clark, formerly of the Air Service, and chief engineer of the Dayton Wright Co., has been conducting wind tunnel tests of the wing for several months.

According to G. M. Williams, general manager of the Dayton Wright Co., the Dayton Wright Wing will increase the speed of an ordinary type bombing or commercial airplane from 125 miles to 150 m.p.h. and its load of explosives or merchandise from 450 lb. to over 2,500 lb. in addition to fuel for a 1000 mile flight. The landing speed remains the same. It enables the commercial pilot to load his machine to the maximum and vastly increase his speed on routes where ordinary landing fields are available, or on new routes over emergency and small fields, he can so reduce his landing speed as to alight in a comparatively small area. This makes possible the establishment of terminal facilities only a few hundred feet square in the heart of large cities.

Development of National Resources

The interests responsible for the development of the newly discovered borax deposits in Clark county, Nev., are showing creditable business acumen in using an airplane as a means of transporting consulting technical experts to the borax fields.

Air Mail Reorganization

Under the direction of Postmaster General Hays an investigation of the Air Mail Service is being held for the purpose of determining what routes should be retained or abandoned from the standpoint of the development of commercial aeronautics, and the rapid dispatch of the mails. Postmaster General Hays believes that the Air Mail is one of the best means for the development of aeronautics because, first, it requires that continuous flying be done under constantly varying conditions; second, it develops a trained personnel which is a national asset in peace and war; third, it develops a system of airways and aids to aerial navigation; fourth, it requires that an efficient meteorological service be maintained; fifth, it develops radio communication methods as applied to airplanes.

There are in progress conferences between the Post Office Department, War Department and the Department of Commerce for the purpose of studying the problem of getting the best results from the Air Mail Service. These conferences have to do at present largely with the standardizing of parts and personnel. It is intended to have the Post Office Department, in such work as it may accomplish in the development of aeronautics, cooperate with the War and Navy Departments. The Department of Commerce is interested by virtue of the future assured to commercial aeronautics.

The War Department has assigned to the Air Mail Service an officer who is making a survey of conditions, and is preparing a report which it is hoped will be helpful in bringing about coordination of the various governmental aeronautical interests.

Present indications point to the transcontinental route being the mainstay of the Air Mail Service. It is a route which offers the greatest opportunities for the development of personnel and for experimental work which will be of value to the Army as well as the Air Mail Service and the cause of the development of commercial aeronautics. In connection with the last named there are different schools of thought.

One school maintains that the Post Office Department should not expect indefinitely to conduct the Air Mail, especially where short trips are involved, and that it should as soon as possible relinquish the service to private interests. Advocates of this idea claim that the theory upon which the Air Mail Service was inaugurated was to do pioneering work, and thus demonstrate that an air service was possible.

There are some advocates of the so-called continental system which provides for an extra charge on mail transported by air; the charge being retained, in whole or in part, by the operating company.

Whatever plan is adopted, it will be the purpose of those who direct the Air Mail Service to stimulate the development of commercial aviation.

Reduction in Air Service Personnel

In compliance with the government policy of economy the Army Air Service has, progressively for over a year, reduced its civilian personnel so that by July 1, 1921, it will have reached an irreducible minimum.

The following table shows the strength of the civilian personnel of the Air Service on respective dates:

July 1, 1920	860
January 1, 1921	732
May 1, 1921	628
July 1, 1921	309

The last figures are made necessary by the L.E.J. Bill for the fiscal year ending June 30, 1922, which will provide about $350,000 for civilian personnel in the office of the Chief of Air Service as against $948,000 available a year ago.

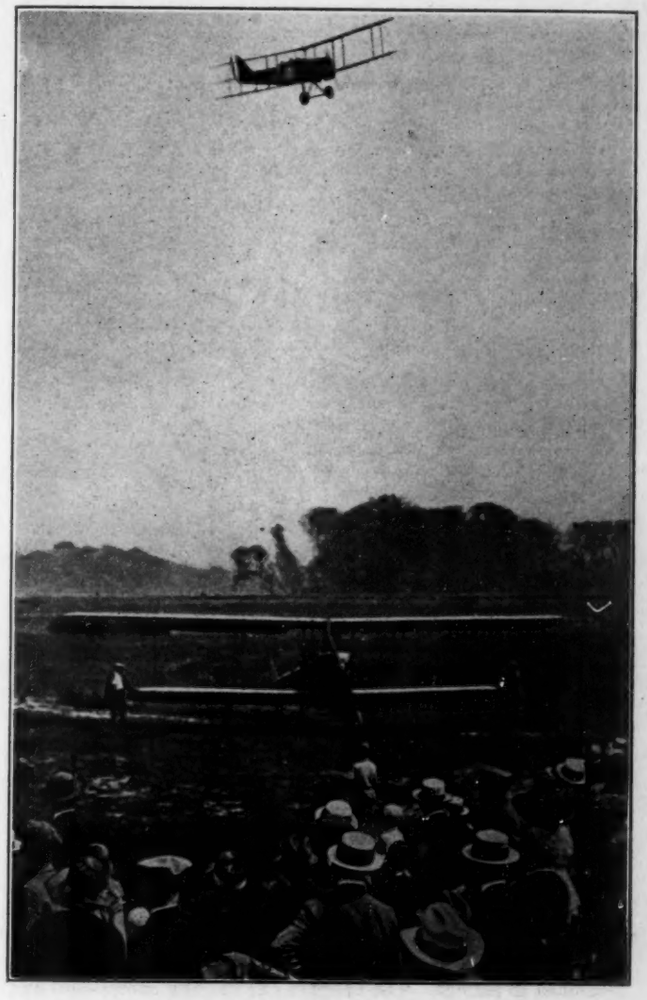
New Air Line

The Great Lakes Airways Co. will shortly establish a passenger air service between Cleveland and Detroit using Aeromarine Navy HS-2L five-passenger flying boats. Two trips will be made per day, each trip taking about an hour and a half.

Congratulations

For the first time in its history, the Air Mail Service for the week ending June 11 had 100 per cent performance on all divisions.

Changes in the Air Mail Service, which become effective July 1, involve the discontinuance of the route from Chicago to Minneapolis, and the route from Chicago to St. Louis. The aviation fields at College Park, Maryland, Bustleton, Pennsylvania, Newark, New Jersey, St. Louis, Missouri, Minneapolis, Minnesota, and LaCrosse, Wisconsin, will be abandoned



A Glimpse of Brainard Field, Hartford, Conn., Recently Inaugurated

shortly after July 1. It has been necessary to abandon these routes because Congress has not appropriated any money for their operation during the next year. The personnel on these discontinued routes will be transferred to the transcontinental route and as far as possible utilized on regular work or on the reserve list. The equipment will also be utilized in this manner.

The transcontinental route from New York to San Francisco will be continued as usual under appropriation made by Congress.

A New Parachute

F. M. Lemon of Oklahoma City is the inventor of a parachute which has performed successfully under test.

The inventor, equipped with his parachute, recently jumped from an airplane at an altitude of 150 ft. and landed safely.

No structural details of the invention are yet available other than that it is equipped with an automatic opening device.

Airdrome Notes

Naval Air Stations

Following is a list of stations of the United States Navy where landing fields are at present available (*Notice to Aviators No. 5, 1921.*):

OPERATING STATIONS

	Type of field
U. S. Naval Air Station, Rockaway, Long Island, N. Y.	SP, —, LA.
U. S. Naval Air Station, Anacostia, D. C.	SP, LP, —.
U. S. Naval Air Station, Hampton Roads, Va.	SP. LP, LA.
U. S. Naval Air Station, Pensacola, Fla.	SP, LP, LA.
U. S. Naval Air Station, Coco Solo, Canal Zone	SP. LP. LA.
U. S. Naval Air Station, San Diego, Calif.	SP, LP, LA.
U. S. Naval Air Station, Pearl Harbor, T. H.	SP, LP, —.

NONOPERATING STATIONS

U. S. Naval Air Station, Chatham, Mass.	SP, —, LA.
U. S. Naval Air Station, Cape May, N. J.	SP, —, LA.

ABANDONED STATIONS

Morehead City, N. C. (taken over by the Coast Guard).
Brunswick, Ga.
Miami, Fla.
Key West, Fla.

U. S. MARINE CORPS STATIONS

Marine Flying Field, Quantico, Va.	SP, LP. LA.
Marine Flying Field, Parris Island, S. C.	SP, LP, —.
Marine Flying Field, Port au Prince, Haiti	SP, LP. —.
Marine Flying Field, Santo Domingo, D. R.	SP, —, —.

[SP—Seaplanes. LP—Landplanes. LA—Lighter-than-air ships.]

NOTE.—At nonoperating and abandoned stations landing facilities only are available.

Manila, P. I.

The Governor-General of the Philippine Islands states in his annual report to the Secretary of War that he has approved the purchase of a site near the city of Manila for the creation of an airdrome. Accommodation will be provided for airplanes, seaplanes and airships.

Newark, N. J.

The discontinuance of the New York-Washington route of the Air Mail Service has brought about the closing of Heller Field, Newark, N. J. The passing of this airdrome will not be regretted by those who have had occasion to use it, for it was notorious among air mail pilots as providing difficulties in taking off and landing.

Kokomo, Ind.

The Curtiss-Indiana Co. recently removed its equipment to a new airdrome on the outskirts of Kokomo, Ind. The ground is a T shape and comprises 100 acres with free approach from all directions. The company has obtained a twenty year lease on the site and intends to maintain a large number of machines in service. The hangars are nearing completion and the field marker, consisting of a 60-ft. cross in a 100-ft. circle is already in position.

The facilities of the airdrome are extended to all pilots with nominal charges for labor and materials. The field is said to be the best in the United States, better even than the old Kokomo airdrome, which itself had a great reputation.

Hartford, Conn.

The Municipal Aviation Commission has decided to name the new airdrome at Hartford Brainard Field in honor of the mayor who has been instrumental in its establishment.

Sterling, Colo.

In response to communications from aviation headquarters at Mather field, Sacramento, Calif., the Lions club of Sterling and the Sterling Chamber of Commerce have taken an option on the Frost field in Sterling to be used as a permanent landing field.

The Lions club has been working on this proposition for some time, and secured the cooperation of the city council in leveling and conditioning the landing field. Hangars will be erected by popular subscription.

G. Leland White, former lieutenant in the Air Service is in charge of the operation for the two Sterling civic bodies. Work will commence immediately.

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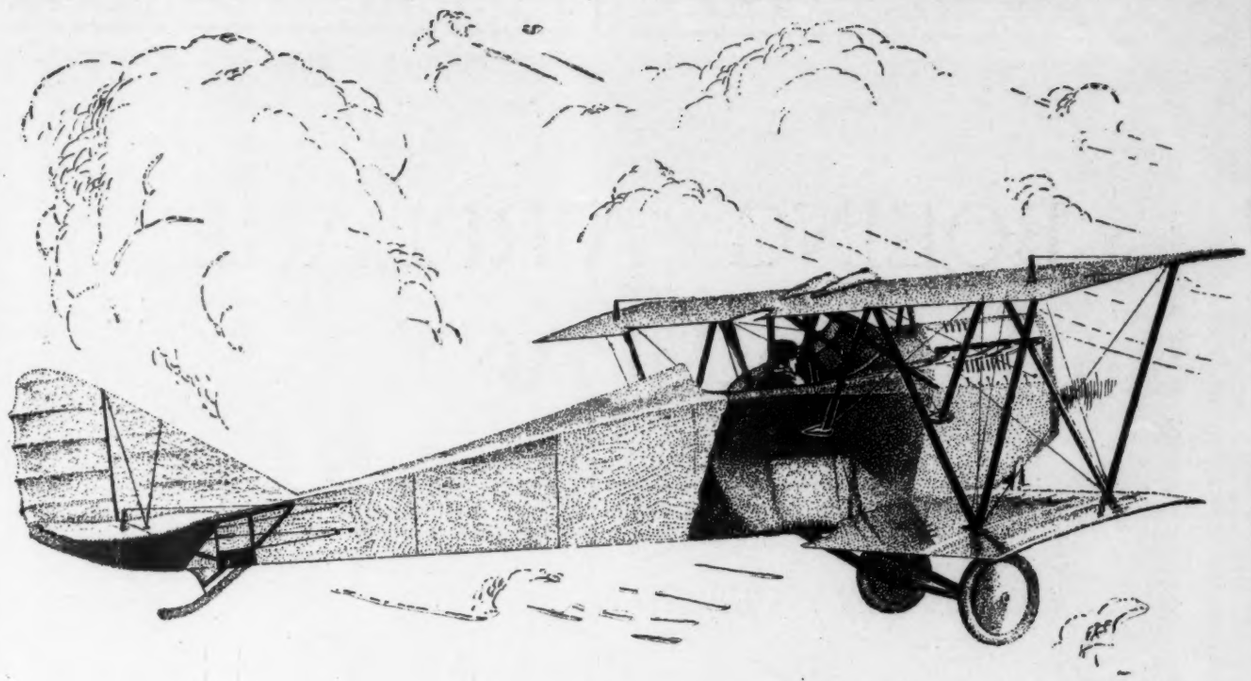

From Rome to Tokio—

IN the remarkable Rome-Tokio flight made under the auspices of the Italian Government in February, 1920, four Ansaldo S.V.A.'s flew 10,000 miles without a forced landing. Ansaldo S.V. A.'s can now be purchased in the United States and they are *Valsparred of course.*

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INDEX TO ADVERTISERS

A

Aero Import Corp..... 31
Aeromarine Plane & Motor Co..... 4
Aircraft Materials Equipment Corp..... 29
Aircraft Service Directory..... 30

B

Barker, Frederick W..... 28
B. G. Corporation..... 28
Boeing Airplane Co..... 26

C

Curtiss Aeroplane & Motor Corp..... 3

D

Dayton Wright Co..... 2
Diggins, Ralph C., Co..... 28

F

Flottorp Manufacturing Co..... 29

H

Huff, Daland & Co., Inc..... 27

K

Klemin, Alexander, and Associates..... 28

L

Laird, E. M., Co..... 5

M

Martin, The Glenn L., Co..... 32

R

Roebling's, John A., Son's Co..... 29

S

Sperry, Lawrence, Aircraft Co., Inc..... 28

T

Thomas-Morse Aircraft Corp..... 27

V

Valentine & Co..... 25

W

War Department, Air Service..... 16-17
Wellington, Sears & Co..... 29
Where to Fly..... 24
Wright Aeronautical Corp..... 3

Flottorp Manufacturing Co.

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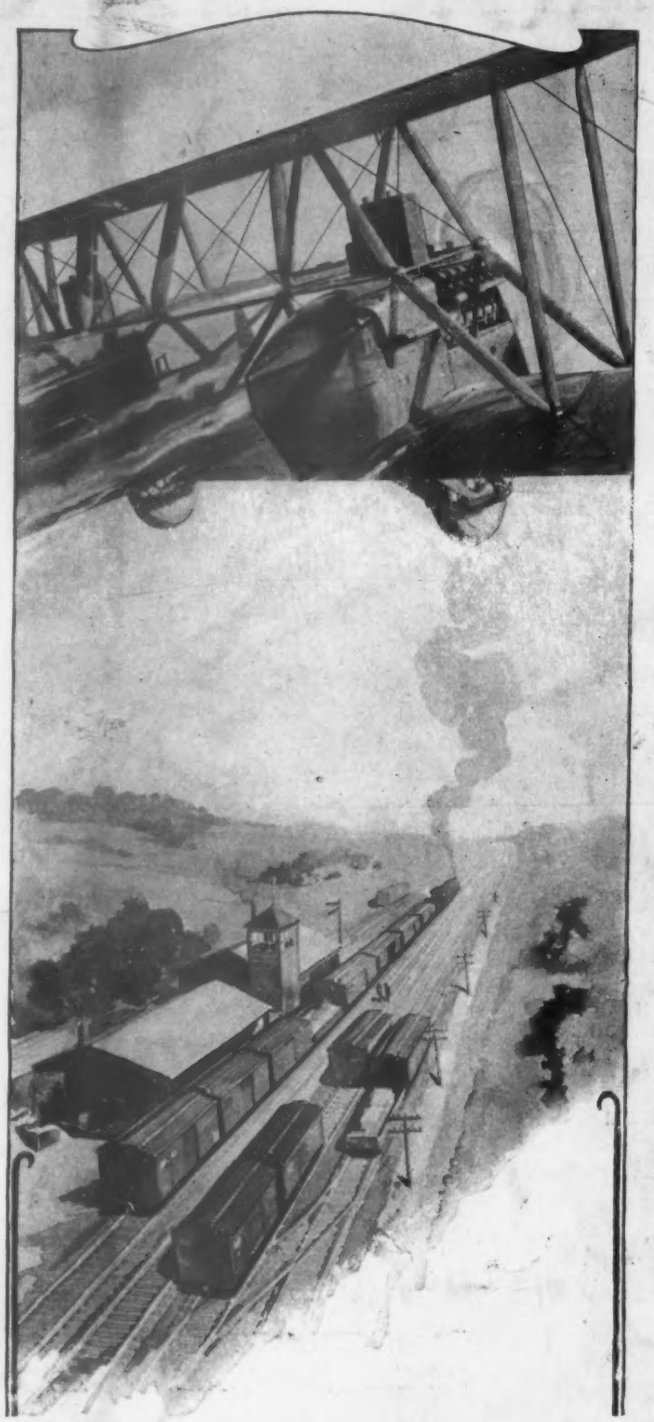

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